USER MANUAL

ELEVATOR CONTROL PANEL
CLOSE LOOP DC MGSET

CQM1 PROCESSOR
IPC STATIC DRIVE

JVV-2000 SERIES
CODE B44-04

JVV-2000 TMGS A
VERSION 4.7

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NOTES AND PRECAUTIONS

? The controller must be installed by competent people who possess the suitable training and cards for the installation of elevator controllers ;

? The controller's power supply must come from a fuse switch supplied by others. The fuses value must respect the electrical code.

? It is necessary to install a separate conductive element to ground the controller in the mechanical room. To know the size of the conductive element, check the electrical code. An indirect grounding (e.g. water pipes) may cause intermittent troubles and electrical noises may occur.

? To avoid problems caused by transportation and handling, check and tighten all the points of connections on the side "power"; from main power supply of the controller to the motor;

? Please note the controller comes with a one (1) year guarantee, effective on the day of billing. An improper usage of the controller, an incorrect connection or the disregard of the owner's manual may void the guarantee. Also note only the components are guaranteed;

? In case of an incorrect connection, the controller is protected by TVS which can short-circuit. Verify the functioning and replace them if needed.

? Allow enough space between the resistor bank, located on top of the controller, and the machine room ceiling for the dynamic breaking resistor may be from 4,000 to 10,000 watts (see drawings).

Conditions of Operation:

? The 3 phases entry voltage can vary 10 % more or less ;

? 60HZ, 50HZ standard frequency available on special order ;

? 0 to 45°C (32 F to 113 F) operation temperature;

? 95 % relative humidity;

? NEMA 1 standard enclosure. Do not install the controller in a dusty environment or where there is risk of water infiltration. Other types of enclosures are available upon request (NEMA 4, 12 etc.);

? Please communicate with Automatisation JRT Inc. if the motor is installed 50 ft. or more from the controller ;

? CSA approval.

General information:

JVV-2000 series controllers were developed for a quick and easy installation and operation. The controllers hold functions of internal self-diagnosis which allow for an easy maintenance. Moreover,

several functions are programmable by the user. Thus, it is very important to read thoroughly the manual, for a quick and secure installation. Please note this controller cannot operate without an encoder.

General features:

? Number of floors: 64

? Maximum number of cars: 12

1. TEMPORARY START-UP:

A. Put jumpers between the following terminals:

? "J" and "J5" (rope gripper line).

? "J5" and "J7" (pit acces circuit).

? "J7" and "J9" if you do not have the car top inspection box.

? "J9" and "J10" (the car stop switch).

? "J10" and "LNH" (up normal limit).

? "J10" and "LNB" (down normal limit).

? "J9" and "LRH" (the top mechanical slow down switch).

? "J9" and "LRB" (the bottom mechanical slow down switch).

? "J9" and "PP" (hall doors closed).

? "J9" and "PC" (car door closed).

? "J9" and "HDL" (hall doors locked if manual doors or motorised cam).

? "RG5" and "RG7" (rope gripper contacts).

? "J5" and "GOV" (115% over speed).

? "J0" and "THM" (motor temperature sensor).

Elevators running at 300 FPM and more:

? "J9" and "LRH1" (the 1st top mechanical slow down switch).

? "J9" and "LRH" (the 2nd top mechanical slow down switch).

? "J9" and "LRB1" (the 1st bottom mechanical slow down switch).

? "J9" and "LRB" (the 2nd bottom mechanical slow down switch).

Elevators running at 250 FPM and more:

These controllers require Emergency terminal stopping devices.

If you have 1 stage of emergency terminal stopping device:

? "J9" and "SLH" (top landing emergency terminal stopping device).

? "J9" and "SLB" (bottom landing emergency stopping device).

If you have 2 stages of emergency terminal stopping devices:

? "J9" and "SLH1" (1st stage top landing emergency terminal stopping device).

? "J9" and "SLH" (2nd stage top landing emergency terminal stopping device).

? "J9" and "SLB1" (1st stage bottom landing emergency terminal stopping device).

? "J9" and "SLB" (2nd stage bottom landing emergency terminal stopping device).

B. Feeding the controller. The main power goes to "L1, L2 and L3" terminals in the controller.

C. The reverse phase relay "RPR" has to be in phase with the network. The red and green lights on the module have to be ON if the unit is in phase. Swap two phases at the power input if it is not properly activated.

D. You must adjust the AC motor overload relays (RS1):

? Direct start: Adjust the overload relay according to the full load motor current (see motor nameplate).

? Start/Delta: Adjust the overload relay according to the full load motor current multiply by **0.572** (see motor nameplate).

Exemple:

22 AMP X 0.572 = 12.5 AMP

E. You must adjust the DC motor overload relay (GOL): See section 5.2.

F. The "SBR" relay must be energized. That relay monitors the brake power supply.

G. Measure:

? The controller supply voltage (see drawings)

? 120 VAC across "J" and "N", "JC" and "N".

? 24 VDC across "+A" and "COM", "+AC" and "COM", “+DC” and “COM” (Internal voltage) "+G" and "COM" (group only)

H. "POWER" and "RUN" green lights on the PLC should be on at all time.

I. Carry on the MGSET start-up procedures described in chapter 5 (up to 5.6.6 inclusively).

J. Connect the "DOWN" button across "+A" and "PCH" terminals and your "UP" button across "+A" and "PCB". Do not connect "ISR" terminal. The corresponding light on the PLC has to be absolutely off.

K. At this point of the set-up procedure, you verify:

Relays needing to be energized:

? PC, PP, SPR, R5, ETSL (for 200 FPM and more).

? HDL (hall doors locked contact of manual door or motorised cam).

? GTS, DLT (rope gripper).

? RHT (perforated tape).

Relay needing to be de-energized:

? ISR

PLC inputs needing to be activated:

? +DC, RDY, PP, PC, J, J9, LNH, LNB, SR, GTS, RG5.

? HDL (Hall doors locked contact if manual door or motorised cam).

? LRH, LRB = elevators running at 250 FPM and less.

? LRH1, LRH, LRB1, LRB = elevators running at 300 FPM and more.

? THM if the motor has a thermal sensor.

? SLH, SLB = elevators running at 200-250 FPM.

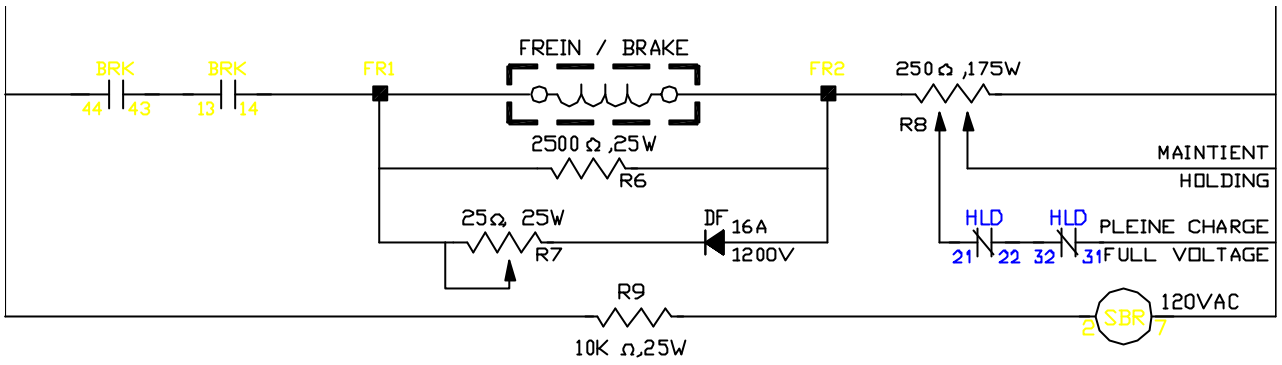
? SLH, SLH1, SLB, SLB1 = elevators running at 300 FPM and more.

L. Proceed to the temporary brake adjustments.

? Adjust the mechanical brake and proceed to the adjustments described in section 11.21.

? Move the elevator in inspection mode and measure the voltage at terminals "FR1" and "FR2". Adjust the brake required start voltage (full load), using the R8 resistor left cursor. Also adjust the brake holding voltage using the R8 resistor right cursor (see section 2).

The brake must be completely activated after 0,2 second. Modify the DM47 to insure the drive holds back the elevator.



IMPORTANT

PLC inputs are designed to operate at 24VDC. DANGER: Never apply 120VAC for it may cause severe damage to the PLC inputs.When the controller is delivered, the "0V" and "COM" terminals are tied to ground.

2. FINAL START-UP:

A. Proceed to steps B-C-D-E and F as described in chapter 1 (temporary start-up).

B. Measure the controller's power supply voltage. Measure the 120 VAC voltage across the "J" and "N", and "JC" and "N" terminals, and the 24VDC voltage between the "+A" and "COM", "+AC" and "COM", "+DC" and "COM" (internal voltage) and "+G" and "COM" terminals (for group only).

C. "POWER" and "RUN" green lights on the PLC must be on.

D. Place the elevator in "MAINTENANCE" mode with the switch in the controller. Put the inspection switches to "NORMAL" position. You will then be able to place car calls without the doors opening.

E. Relays that must be energized: PC, PP, ISR, (RHT = with perforated tape), GTS, DLT, R5 (ETSL with elevators running above 200 FPM).

F. At this point, mechanical slowdown limits need to be jumped again.

G. The speed tachometer has to be installed (Refer to section 5.1.6).

H. Adjust the brake.

? Adjust the mechanical brake and proceed to the adjustments described in section 11.21.

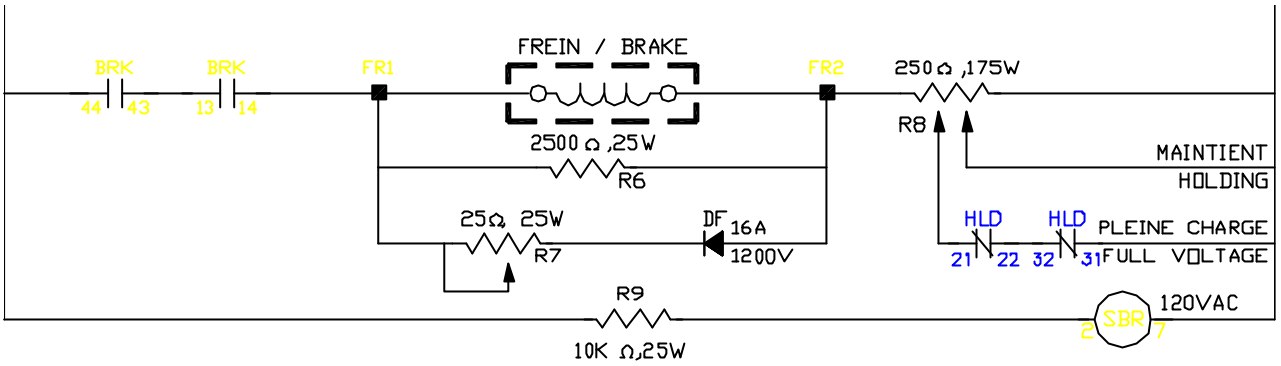
? Adjust the required start voltage (full voltage) using the R8 resistor left cursor. Also adjust the brake holding voltage using the R8 resistor right cursor.

? Move the elevator in inspection mode and measure the voltage at "FR1" and "FR2". The brake start voltage should normally be at the 200 volts. If it is not, adjust the R8 resistor left cursor. The holding voltage must be adjusted using the right cursor, which is controlled by the "HLD" relay. In order to reduce the brake voltage, this relay only activates after the delay programmed in the DM0044.

? Some models have a diode with a 25 ohms R7 resistor adjustable in parallel with the brake. This circuit can make the brake quicker or looser. The lower the 25 ohms R7 resistor is, the quicker the brake is. For a very quick brake, disconnect the 25 ohms R7 resistor.

Moving the R7 resistor cursor helps attain the ideal delay to allow the drive to stop the motor rotations before the brake closes. If the R7 resistor is at its maximum and the brake still takes an excessive amount of time to drop, open the circuit between the R7 resistor and the free wheel diode.

The brake must be completely applied after 0.2 sec. Modify the DM47 to ensure the drive holds back the elevator.



I. Proceed to motor temperature sensor setting (see section 11.22).

J. Proceed to the tape selector or governor encoder adjustments: with standard tape selector (see section 4.1), perforated tape selector (see section 4.3), or if with governor encoder (see section 4.4).

K. Finish the IPC card adjustments (see section 5.6).

L. For 200 FPM elevators, make the final adjustments of the uncontrolled speed board "JRT-OVS-GL2" (See section 7).

M. Proceed to elevator start and stop floor adjustments (see section 5.6.3).

The brake has to be applied completely after 0.2 sec. change DM47 delay to make sure the drive holds the elevator.

Proceed to the mechanical adjustments of the brake.

N. Proceed to mechanical slow-down adjustments: with standard tape selector (see section 6.2).

O. Install the perforated tape bar code reader magnets (see section 4.5)

P. Remove jumpers on the mechanical slow down limits.

Q. Proceed to the adjustment of the emergency terminal stopping device on elevators running above 200 FPM (see chapter 6).

R. Adjust the hoistway access travelling limits (see section 4.6)

S. You must do the full load test at leveling speed at top and bottom floors to be sure that the car will be able to replace equal to the floor.

T. See section 5.9.8 for 125% over speed test.

U. Cancel all alarms, turn on and off the "MAINTENANCE" switch 4 times in a period of 30 secondes.

IMPORTANT

PLC inputs are designed to operate at 24 Volts. DANGER: Never apply 120VAC for it may cause severe damage to the PLC inputs.

When the controller is delivered, the "0V" and "COM" terminals are tied to ground.

3. CONTROLLER TYPE:

3.1. TWO CAR GROOP CONTROLLER (WITHOUT DISPATCHER):

A. Supply power to L1-L2-L3 inputs independently for each control. Each control must have its specific disconnection switch. There is no need for a separate power supply for the group itself.

There is a PLC in each controller; as soon as the two PLC's are tied together through their RS232 port, they automatically become a group and start dispatching hall calls to one another. If the communication link is broken, they start working as two separate controllers. Therefore, you do not have to connect both controllers together during building construction.

That type of controller provides continuous dispatch back up service. This means that as soon as one of the controllers is turned off, looses power, or becomes in trouble, the other one takes over all hall calls without clearing any of them.

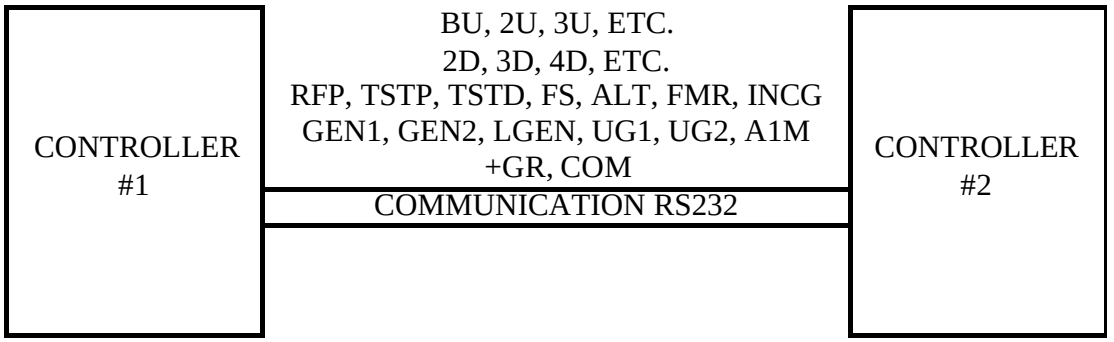
Two car group (duplex) connection:

You must connect to both controllers:

- The common supply to the group: +G, COM;
- The entire hall calls BU, 2U, 3U, etc.2D, 3D, etc.;
- Phase 1 fire services, if there is any: RFP, TSTP, TSTD, FS, ALT, FMR, INCG;
- Emergency generator services if there is any: "GEN1, GEN2, LGEN, UG1, UG2, A1M.

B. Hence, connect hall calls; phase 1 fire service and emergency generator services to the first controller installed. To connect in duplex mode during the start-up of both controllers, begin by connecting one controller to the other, while making the connections listed above and shown in the drawings.

C. Finally, connect the RS232 link between both controllers using the cable provided.



Since each controller has its own CPU, if a change is made to a timer (see chapter 10) or if a function is programmed (as described in chapter 11), it must be made in both controllers.

3.2. THREE AND MORE CAR GROUP CONTROLLER (WITH DISPATCHER):

A. Supply power to L1, L2 and L3 inputs independently for each controller. Therefore, a main switch is required for controllers #1, #2, #3, etc. For the dispatcher, a separate 120VAC power supply is required.

Each simplex controller has its own CPU, which automatically changes to group mode, when connected to the group network. At that moment, the group dispatches hall calls to each controllers according to a sophisticated algorithm.

The program enclosed in the group is designed to operate in simplex, duplex, triplex (…) modes. The transition between these modes is automatic.

Each simplex controller has a back up sequence in case the group is not present. Each controller takes over certain hall calls (according to predetermined areas depending on the project) and takes over every car call. This sequence is controlled by JRT-PAL-GL1 boards and zone relays. To easily recognize when the controllers are in the backup sequence, press the hall call (on the way up or down) and two lights will simultaneously turn on and off. Please note the hall calls will cause car calls which will be taken over regardless of the direction of the car.

Example:

In the case of a twelve-storied triplex, the first controller could take over hall calls for the floors number 1 to 4; the second controller those for the floors number 5 to 8. The third controller would take over hall calls for the floors number 9 to 12. Finally, each controller takes over all car calls.

Group connection:

You must connect to all controllers:

? Supply terminals switches COM, +G and +GR;

? Phase 1 fire services: RFP, TSTP, TSTD, FS, ALT, FMR, INCG;

? Emergency generator services if there are any: GEN1, GEN2;

? Hall calls: BU, 2D, 2U, etc., TD;

? RS485 communication cables (2 shielded pairs): TX+, TX-, RX+, RX, SHD.

B. Therefore, connect "COM" and "+G" terminals, the phase 1 fire service and the emergency generator services to the first installed controller. To connect in triplex or quadruplex mode during the three controller's start-up, you must first link the controllers together by making the right connections, as shown in the previous section (or refer to the drawings).

Connection to the dispatcher:

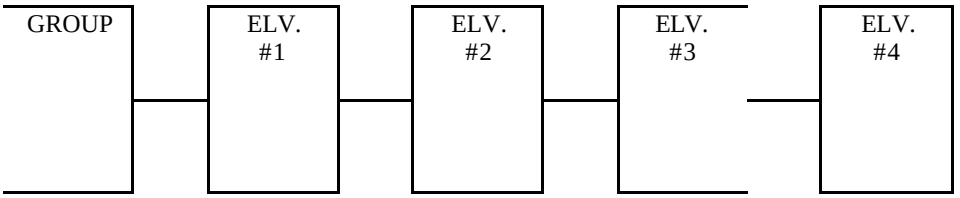
Connect on the dispatcher the following signals:

? All hall calls: "BU, 2U, 3U, etc. and 2D, 3D, etc. ";

? If there are any fire services: "RFP, TSTP, TSTD, FS, ALT, FMR, INCG";

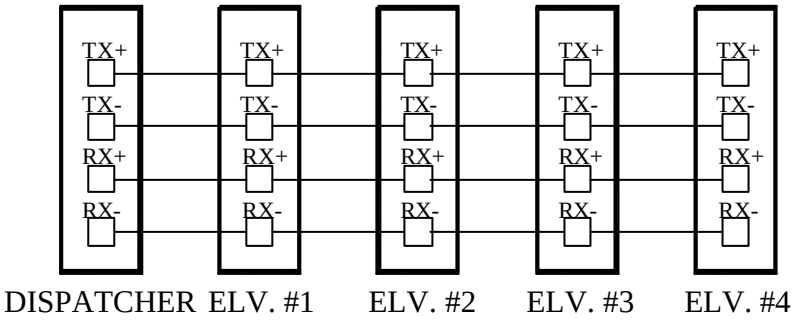
? Emergency generator services, if there are any: "GEN1, GEN2, AUTO, MG1, MG2, MG3, etc";

? RS485 communication cables (2 shielded pairs): "TX+, TX-, RX+, RX, SHD".



Since all controllers have their own CPU, if there is a modification of the timers (see chapter 10), or if there is a programming of the functions described in chapter 11, it should be done on all controllers. If the system has an operator screen, it is possible to carry out, from that screen, the timer modifications and the programming of the specified functions simultaneously on all controllers (Please refer to the operator screen manual).

Network link the controllers as follows (RS485 communication):

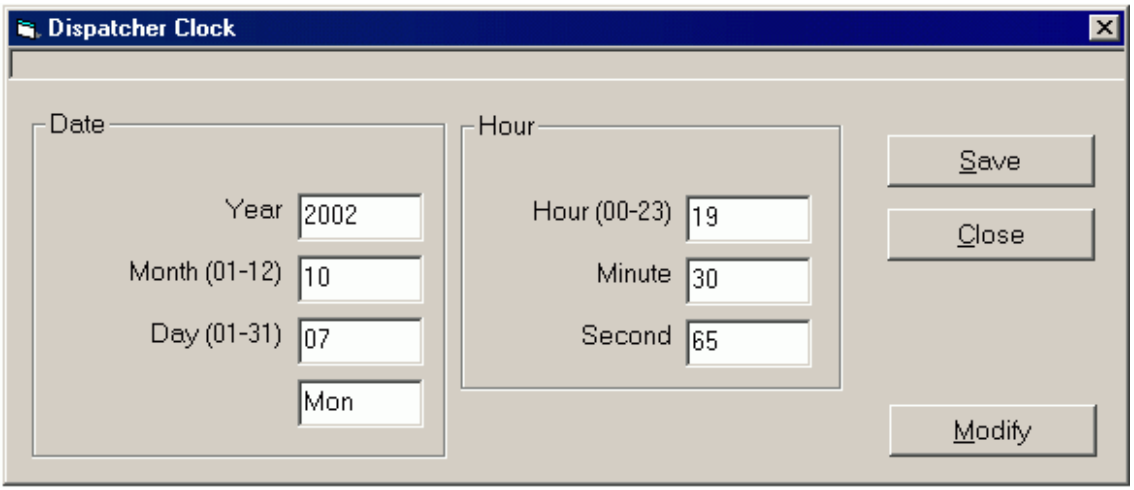


3.3. CLOCK SETTING ON DISPATCHER WITH OPERATOR SCREEN:

The dispatcher has a real-time clock. However, it does not add or subtract an hour automatically come spring and fall. It is primarily used for the rush hour variations grid. Thus, it is important to make sure the clock is set on the right time.

To modify time

? Move the mouse cursor on the clock menu and click on the left mouse button.



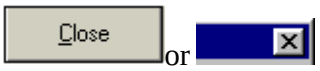
? Move the cursor on MODIFY, and click on the left mouse button. From then on, the data boxes are accessible.

? Move the cursor on the box to modify. Write down the correct data. Repeat this process for each box.

? Move the cursor on SAVE and click on the left mouse button to send the newly set time to the dispatcher. The message SUCCESS should appear at the top of the window. If it is not the case, save again.

The day of the week is automatically determined by Windows. Therefore, it does not need to be adjusted.

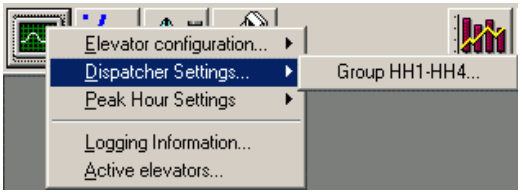
? To exit the window without modifying the parameters, click on one or the other of the buttons shown below.



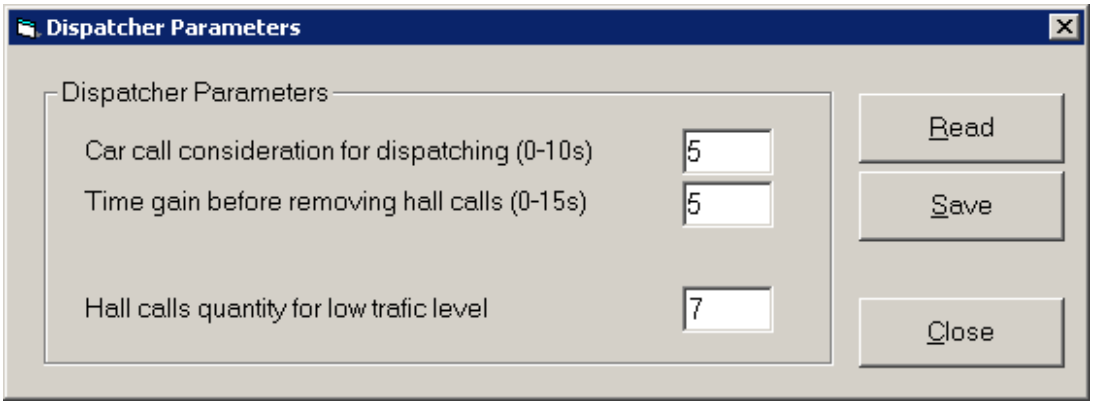
3.4. CALL DISPATCH CONFIGURATION, USING THE OPERATOR SCREEN:

If the elevator group includes an autonomous dispatcher managing hall calls dispatch, it is possible to access this menu:

? Move the cursor over the "SINE WAVE" button, and click on the left mouse button.



? Move the cursor on the DISPATCHER option and click on the left mouse button.



This window allows modifying some of the dispatcher's parameters.

Modifying a parameter:

? To upload current parameters from the dispatcher, move the mouse cursor over the READ button and click on the left mouse button.

? Move the cursor on the box containing the value to modify and click the left mouse button.

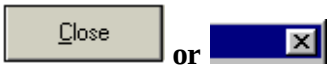
? Write the new value by using the keyboard keys "DEL", "BACKSPACE".

? Repeat these two steps for each parameter to modify.

Saving the parameters in the dispatcher:

? Move the cursor on the SAVE button and click the left mouse button. When the transfer is done, the message SUCCESS should appear at the top of the window. If it is not the case, save again.

? To exit the window without modifying the parameters, move the cursor on one of the buttons shown below and click on the left mouse button:



or

Dispatcher parameters:

? Car call consideration for dispatching (0-10s):

When two elevators are moving in the same direction, this parameter increases the priority of the elevator that has a car call at the same level of a hall call. The hall call should be given to the elevator that has a car call at the same level, but if the elevator is to far from the hall call level compared to the other elevator, the dispatch will optimise the waiting time and give the hall call to the best elevator.

This parameter should be adjusted according to the number of floors, the speed and the number of elevators in the group. Factory setup at 5 seconds.

? Time gain before removing hall calls (0-15s):

The dispatcher computes the waiting time for every new hall calls and previously registered hall calls. When an interesting time reduction is computed, the hall call will be transferred to another elevator. According to the elevators speed, this parameter can be increased if required. If that parameter is too low, hall calls will switch from a car to another rapidly continuously.

Factory setup at 5 seconds.

? Hall call quantity for low traffic level:

This register represents the hall call threshold to indicate a heavy traffic period. When the threshold is reached, a graphic symbol will appear on the computer screen.

3.5. PEAK HOURS SETTINGS:

There are two ways to manage peak hours. There is the automatic detection and the fixed time grid. In the automatic mode, the dispatcher will detect a peak hour by counting calls on a time base. In the fixed time grid, the user specifies at which time peak hours will be effective.

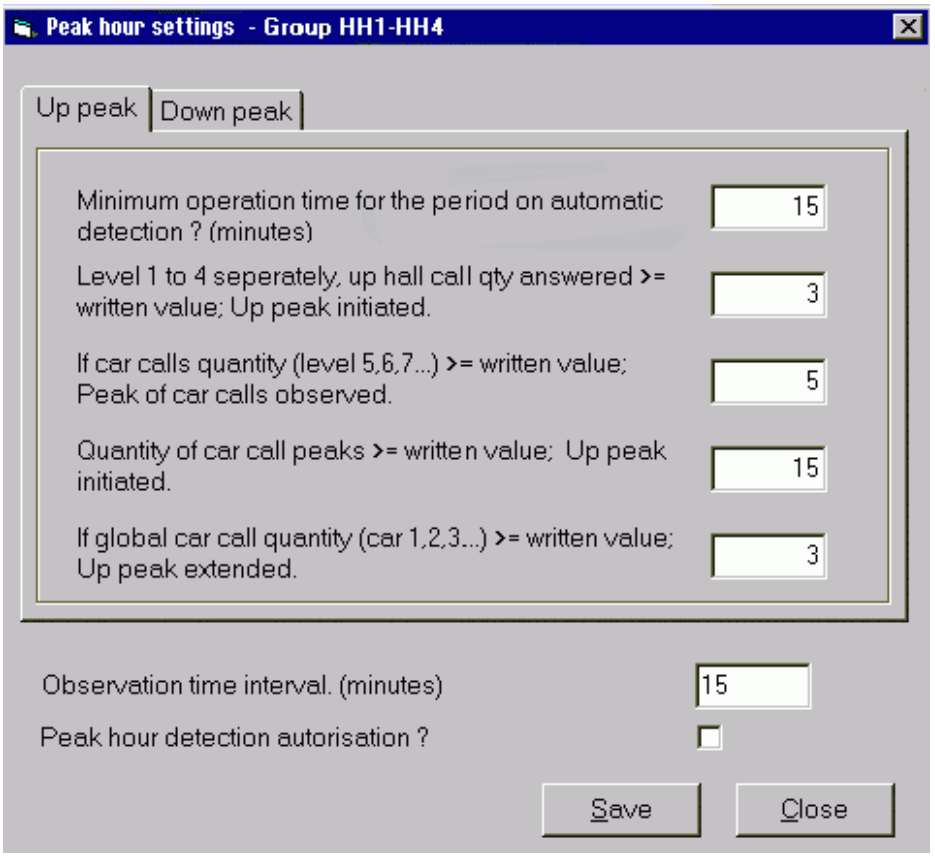
? Move the mouse cursor over the "SINE WAVE" button and press the left mouse button.

? Slide the mouse cursor on the menu "Peak Hour Settings".

? Wait for the menu on the right to appear.

? Slide the mouse cursor to the right to select the desired group dispatcher and click the left mouse button to access the selected menu.

Criteria for automatic peak hours detection:


Peak hour settings - Group HH1-HH4
Up peak
Down peak
Minimum operation time for the period on automatic detection ? (minutes)
15
Level 1 to 4 seperately, up hall call qty answered >= written value; Up peak initiated.
3
If car calls quantity (level 5,6,7...) >= written value; Peak of car calls observed.
5
Quantity of car call peaks >= written value; Up peak initiated.
15
If global car call quantity (car 1,2,3...) >= written value; Up peak extended.
3
Observation time interval. (minutes)
15
Peak hour detection autorisation ?
Save
Close

This window contains a menu bar offering 2 choices for the user.

? Selecting the peak period to modify:

Move the cursor on the text corresponding to the requested peak period, and click the left mouse button. The parameters list should appear with the current parameters.

? Parameter modifications:

Move the mouse cursor on the box containing the value to modify and press the mouse on the left mouse button. Write the new value by using the keyboard keys: DEL, BACKSPACE… Repeat for all parameters to modify.

? Saving modified parameters:

Move the mouse cursor on the "SAVE" button and press the left mouse button. When the transfer is done, the message "SUCCESS" should appear. If it’s not the case, "SAVE" once again.

Up and Down peak parameters are transferred at the same time.

To exit the window without modify the parameters, move the mouse cursor on one of those buttons and press the left mouse button:

or

Up peak parameters description:

? Minimum operation time for the period on automatic detection (minutes)

As soon as an up peak period is detected, this parameter sets the minimum operation time. When that delay is expired, the up peak operation can be extended depending of the building traffic.

? Level 1 to 4 separately, up hall call qty answered >= written value; Up peak initiated

The dispatcher counts answered up calls for the 4 first levels of the building. If the value of 1 of these counters becomes equal or higher of the registered value, an up peak period will be initiated.

When the time interval expired, the counters are reset and the cycle restarts.

Example:

If the dispatcher counts more than 5 up call at floor 3 in a period of 3 minutes, an up peak period is initiated for 33 minutes.

? If car calls quantity (level 5,6,7...) >= written value; Peak of car calls observed

The dispatcher checks for elevators located in the first 4 levels of the building with the up direction.

The dispatcher counts car calls at the fifth and above floors and if the value becomes equal or higher value entered, a car call peak is observed.

When the time interval expires, the counters are reset and the cycle restarts.

? Quantity of car call peaks >= written value; Up peak initiated

When the number of car call peak becomes equal or higher of the value entered, an up peak period will be initiated.

Example:

For 4 cars group, if elevators at floors:

✍ #1 = 1st floor

✍ #2 = 7th floor

✍ #3 = 5th floor

✍ #4 = 4th floor

Only the car calls at floor 5 and more of elevators #1 and #4 are accumulated, when the count of car calls equal 3, an up peak is observed and when the counts is observed 3 tires in a period up 3 minutes, and up peak period is initiated.

? If global car call quantity (car 1,2,3...) equal or higher written value; Up peak extended

When the up peak period operation time has been expired, the system returns in normal mode.

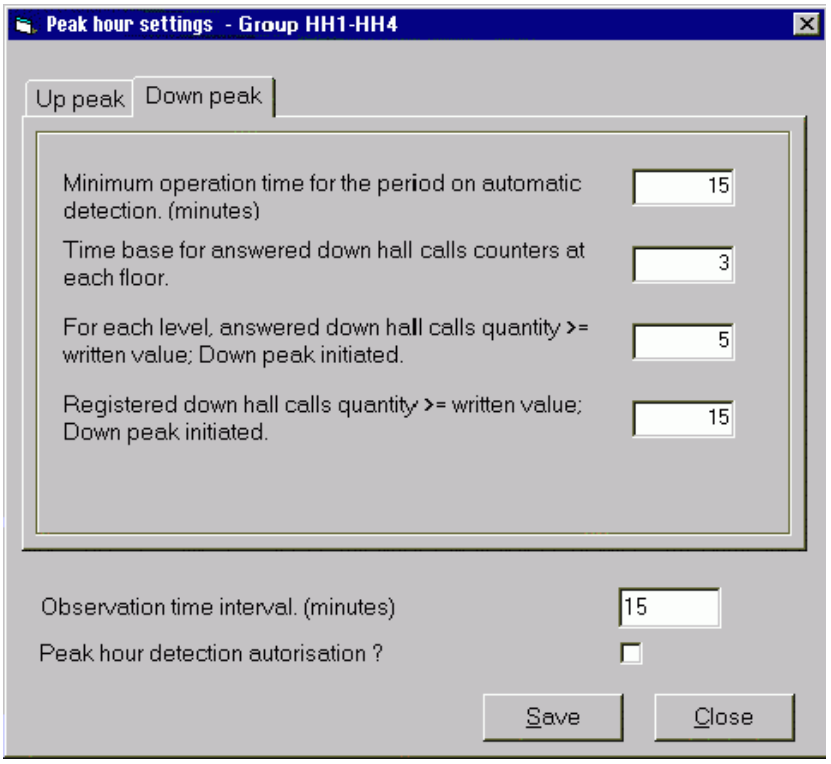
However, the dispatcher counts all car calls of each elevators and if the count is equal or higher of the entered value, the up peak period will be extended.

The period won't be extended as soon as the car call number will become under the entered value.

Example:

Entered value = 0, up peak period extended up to one elevator stopped without any car call.

Down peak parameters description:


Peak hour settings - Group HH1-HH4
Up peak
Down peak
Minimum operation time for the period on automatic detection. (minutes)
15
Time base for answered down hall calls counters at each floor.
3
For each level, answered down hall calls quantity >= written value; Down peak initiated.
5
Registered down hall calls quantity >= written value; Down peak initiated.
15
Observation time interval. (minutes)
15
Peak hour detection autorisation ?
Save
Close

? Minimum operation time for the period on automatic detection. (minutes)

As soon as a down peak period is detected, this parameter sets the minimum operation time. When that delay is expired, the down peak operation can be extended depending of the building traffic.

? Time base for answered down hall calls counters at each floor (minutes):

This parameter sets up the observation time interval of each answered down call counters at each floor.

When the time interval expired, the counters are reset and the cycle restarts.

? For each level, answered down hall calls quantity equal or higher written value; Down peak initiated

The dispatcher counts answered down calls at each level. If one of the counters becomes equal or higher of the entered value, a down peak period will be initiated.

The counters are reset when time base for answered down hall calls is expired.

Example:

If 5 down calls at floor 6 are answered in 3 minutes, a down peak period will be initiated.

The dispatcher will park elevators as the following:

✍ Priority 1 level 6

✍ Priority 2 level 7

✍ Priority 3 level 5

For the down peak operation time

? Registered down hall calls quantity equal or higher written value; Down peak initiated

The dispatcher counts all hall down calls registered in the building during the observation time.

If the counted value reaches the entered value, a down peak period is initiated.

The dispatcher changes the parking priorities and park cars in escalator position in the building.

? Observation time interval. (minutes)

This parameter fixes the interval time to count calls when the time interval expired, some counters are reset and the cycle restarts.

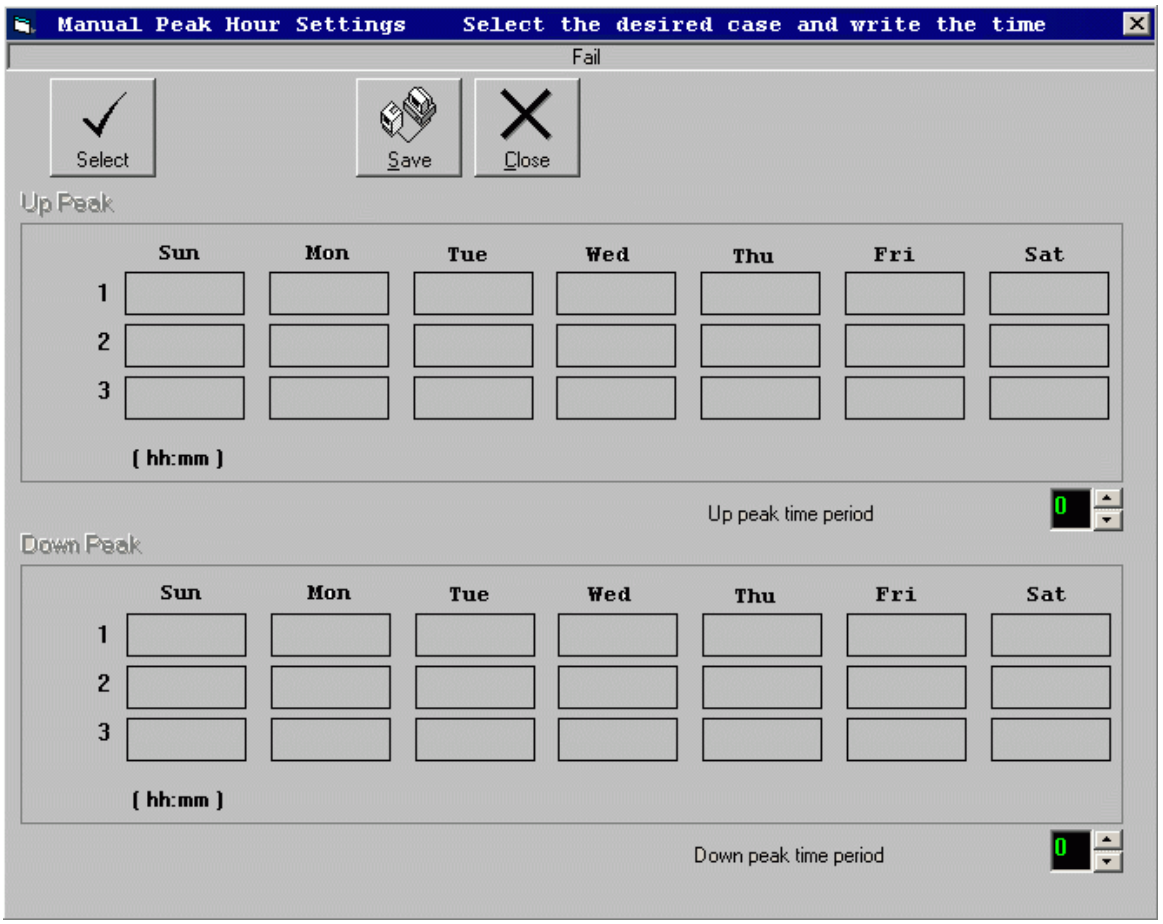
? Peak hour detection authorization

To activate the automatic peak hour detection, you must "check mark" the small square on the right.

Move the mouse cursor in the square on right and press the left mouse button. Press another time to remove it.

Don't forget to save before leaving the window.

Manual peak hours settings:



For the manual peak hour operation, the user can activate Up peak or Down peak at different hours during the week, with the possibility to have up to three peak activation times. The first grid regards up peaks, where as the second grid regards the down peaks.

? Operation:

A grey case represents an unused period, a white case content the peak period initiation time.

? Selecting a case to write an initiation time:

Move the mouse cursor over the button showing the big check mark "SELECTION" and press on the left mouse button. At this moment, the mouse cursor becomes a big check mark.

Move the mouse cursor over the desired grey case and press on the left mouse button. The case will become white and empty. Repeat this operation for each desired cases.

If you press on the left mouse button above a white case, the case will become grey.

When the selection is done, return over the "SELECTION" button and press on the left mouse button to come back with the normal cursor.

? Entering an hour:

Move the mouse cursor on the desired case and press on the left mouse button to be able to modify the hour.

For advanced users, the COPY / PASTE windows operation is possible (mouse on the right).

? Operation time period modification

The user has 21 possibilities to activate peak hour operation. 3 Up peak and 3 Down peak per day.

However, the operation time is the same for all 21 possibilities.

Move the mouse cursor over the up or down arrows on the right of the black case showing the actual operation time and increase or decrease the time by pressing on the left mouse button.

? To save the grid

Move the mouse cursor over the "SAVE" button and press on the left mouse button.

The message "SUCCESS" should appear. If not, save again.

? To exit the window without modify the parameters, move the mouse cursor on one of those buttons and press on the left mouse button.

4. OPERATION PRINCIPLE FOR CAR ZONING AND LEVELLING:

4.1. USING A TAPE SELECTOR ZONING BY MAGNET PULSES:

200 FPM and less:

The steel tape is installed in the hoistway and is divided in three rows of magnets; the first one for the car zoning and up slowdown, the second one for the car levelling and door zoning and the third one for the car zoning and down slowdown. The sensing head is located on the car and the three rows are sensible to North or South Pole magnet. The USL sensor can detect the first magnet row for car zoning and up slowdown. The DSL sensor can detect the third magnet row for car zoning and down slowdown. The four other sensors detect the second magnet row, LU sensor for up levelling, LD sensor for down levelling and DZO and DZO1 sensors for door zoning.

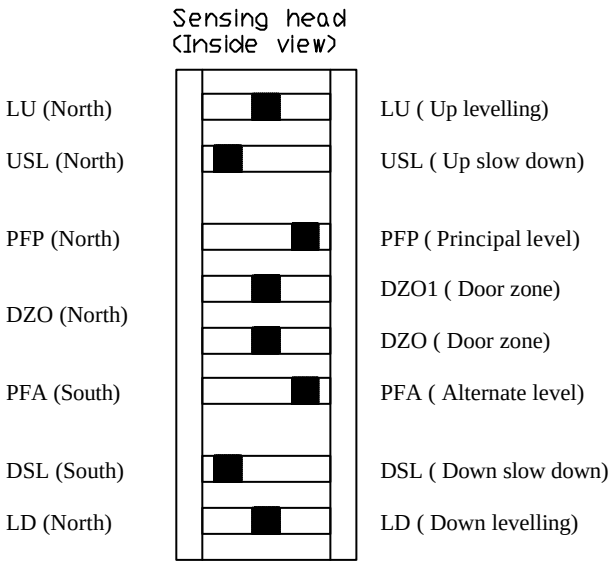
We added the PFP sensor and the PFA sensor to recognize the main and alternative floor on a fire alarm return. The PFP sensor also allow, for each direction, to validate the main floor as a reference level (connect only if PH1 emergency recall operation. To deactivate these sensors, put 1234 in DM127 and DM128).

The sensors can be moved inside the sensing head to facilitate the adjustment of the car positioning. For example, in order to achieve the best possible levelling adjustment, it is better and easier to move the LU and LD sensors than to cut off the magnet on the steel tape.

The USL sensor (going up) and the DSL sensor (going down) engage a slowdown. The calculation method for slowdown distances is 6" for each 25pi/min.

Example:

$$\frac{125\ FPM \times 6\ in}{25\ FPM} = 30\ in$$



In order to place the magnets in the correct position on the steel tape, it is recommended to bring the car at the exact position where the command has to be energized when choosing an intermediate floor.

? Leveling magnets (12" magnet): Bring the car even with the floor and place the magnet on the steel tape, in order for it to energize the DZO sensor but not LU and LD sensors (between LU and LD).

? Up slowdown magnet (USL magnet): Example for a 100'/min up speed elevator. Bring the car exactly 24" below the landing floor and place the magnet on the steel tape, in order for the bottom end of the magnet to energize the USL sensor. (See table #1)

? Down slowdown magnet (DSL magnet): Example for a 125'/min down speed elevator. Bring the car exactly 30" above the landing floor and place the magnet on the steel tape, in order for the top of the magnet to energize the DSL sensor. (See table #1)

? Confirmation of main fire floor slowdown (PFP magnets and USL, DSL): According to the USL and DSL magnets position from the main floor, place the PFP magnets on the tape to activate the PFP sensor. Example, for a 100'/min. elevator: Place the car 24" below the fire landing floor and place the 12" magnet on the tape in order for the bottom magnet to energize the PFP sensor. Do the same process with 24" above the main fire landing floor and place the 12" magnet on the tape in order for the top magnet to energize the PFP sensor. So, if we look at the sensors functioning in the main fire floor, the USL and PFP sensors energize at the same time for the up slowdown and the DSL and PFP sensors energize at the same time as the down slowdown. (See table #2)

? Confirmation of alternative fire floor slowdown (PFP magnets and USL, DSL): According to the USL and DSL magnets position from the alternative floor, place the PFA magnets on the tape to activate the PFA sensor. Example, for a 100'/min. elevator: Place the car 24" below the alternative fire landing floor and place the 12" magnet on the tape in order for the bottom magnet to energize the PFA sensor. So, if we look at the sensors functioning in the alternative fire floor, the USL and PFA sensors energize at the same time for the up slowdown and the DSL and PFA sensors energize at the same time as the down slowdown. (See table #3)

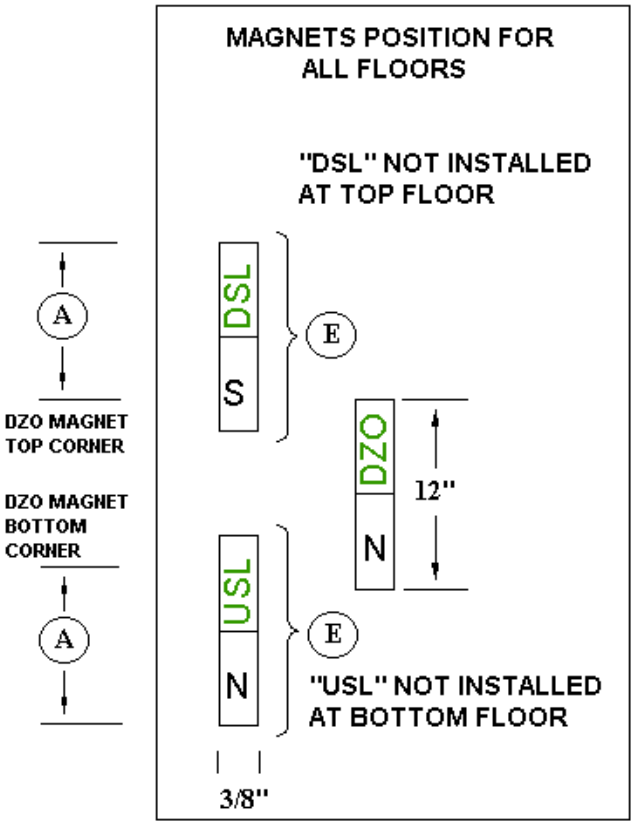
? Confirmation of the main fire floor door zone (DZO and PFP 12" magnets): According to the DZO magnet position from the main floor, place the car even with the main fire floor in order for the DZO sensors to be activated but not LU and LD. Then, place the 12" magnet on the tape in order for the center magnet to energize the PFP sensor. So, if we look at the sensors functioning at the main fire floor, the DZO and PFP sensors energize at the same time to confirm the door zone. (See table #2)

? Confirmation of the alternative fire floor door zone (DZO and PFA 12" magnets): According to the DZO magnet position from the main floor, place the car even with the main fire floor in order for the DZO sensors to be activated but not LU and LD. Then, place the 12" magnet on the tape in order for the center magnet to energize the PFA sensor. So, if we look at the sensors functioning in the alternative fire floor, the DZO and PFA sensors energize at the same time to confirm the door zone. (See table #3)

Then, proceed to the other floors using the same method as described above or using the following procedure: place the 12" magnet (ransient magnet) as described in step 1 above. Then, place the USL and DSL magnets at the same distance from the 12" magnet (ransient magnet) as measured at the previous floor (see points 2 and 3).

It is strongly recommended not to stick the magnets immediately to the steel tape. If a mistake should happen in the positioning, it would still be easy to move the magnets on the tape. Wait until you have made successful tests before sticking definitely the magnets to the tape.

Table #1:

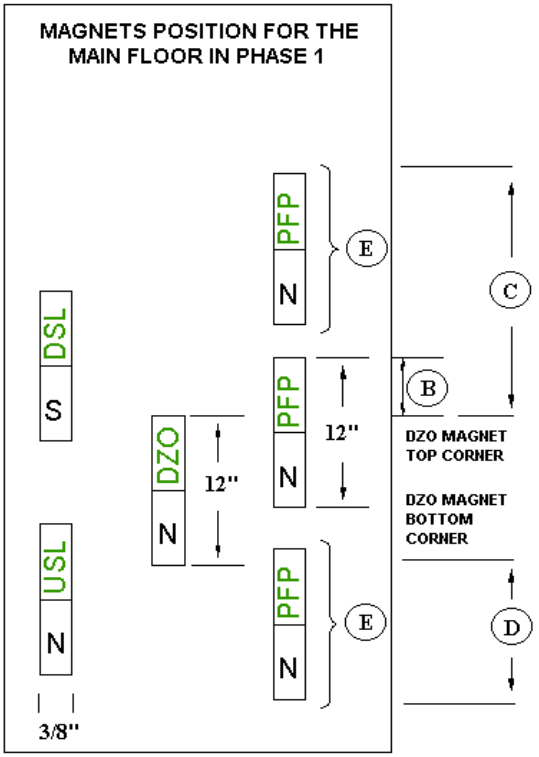


Speed FPM	***50 FPM***	***75 FPM***	***100 FPM***	***125 FPM***	***150 FPM***	***200 FPM***
Deceleration length	12 in	18 in	24 in	30 in	36 in	48 in
A	5 in	9 in	15 in	21 in	27 in	39 in
E (Magnet length)	5 in	8 in	12 in	12 in	12 in	12 in

USL: Up deceleration magnet
DSL: Down deceleration magnet
N: North magnet
S: South magnet
DZO: Door zone magnet

The "DZO" light must be "ON" and "LU" and "LD" lights must be "OFF" when the car is centered in the door zone.

Table #2:



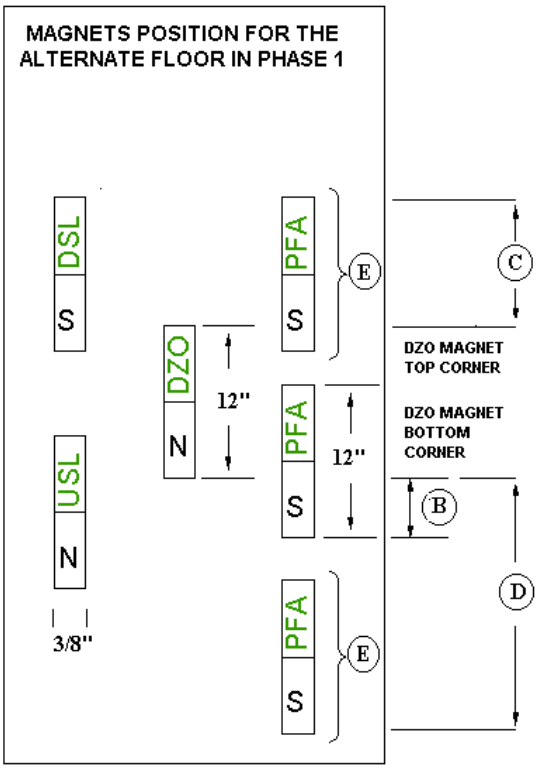
Speed FPM	***50 FPM***	***75 FPM***	***100 FPM***	***125 FPM***	***150 FPM***	***200 FPM***
Deceleration length	12 in	18 in	24 in	30 in	36 in	48 in
B	1 in	1 in	1 in	1 in	1 in	1 in
C	9 ¼ in	13 ¼ in	19 ¼ in	25 ¼ in	31 ¼ in	43 ¼ in
D	7 in	11 in	17 in	23 in	29 in	41 in
E (Magnet length)	5 in	8 in	12 in	12 in	12 in	12 in

USL: Up deceleration magnet
DSL: Down deceleration magnet
N: North magnet
S: South magnet
DZO: Door zone magnet

The "DZO" and "PFP" lights must be "ON" and "LU" and "LD" lights must be "OFF" when the car is centered in the door zone.

Before putting the elevator in automatic mode, move the elevator in inspection at the bottom and the top of the hoist way for the learning of the main floor.

Table #3:



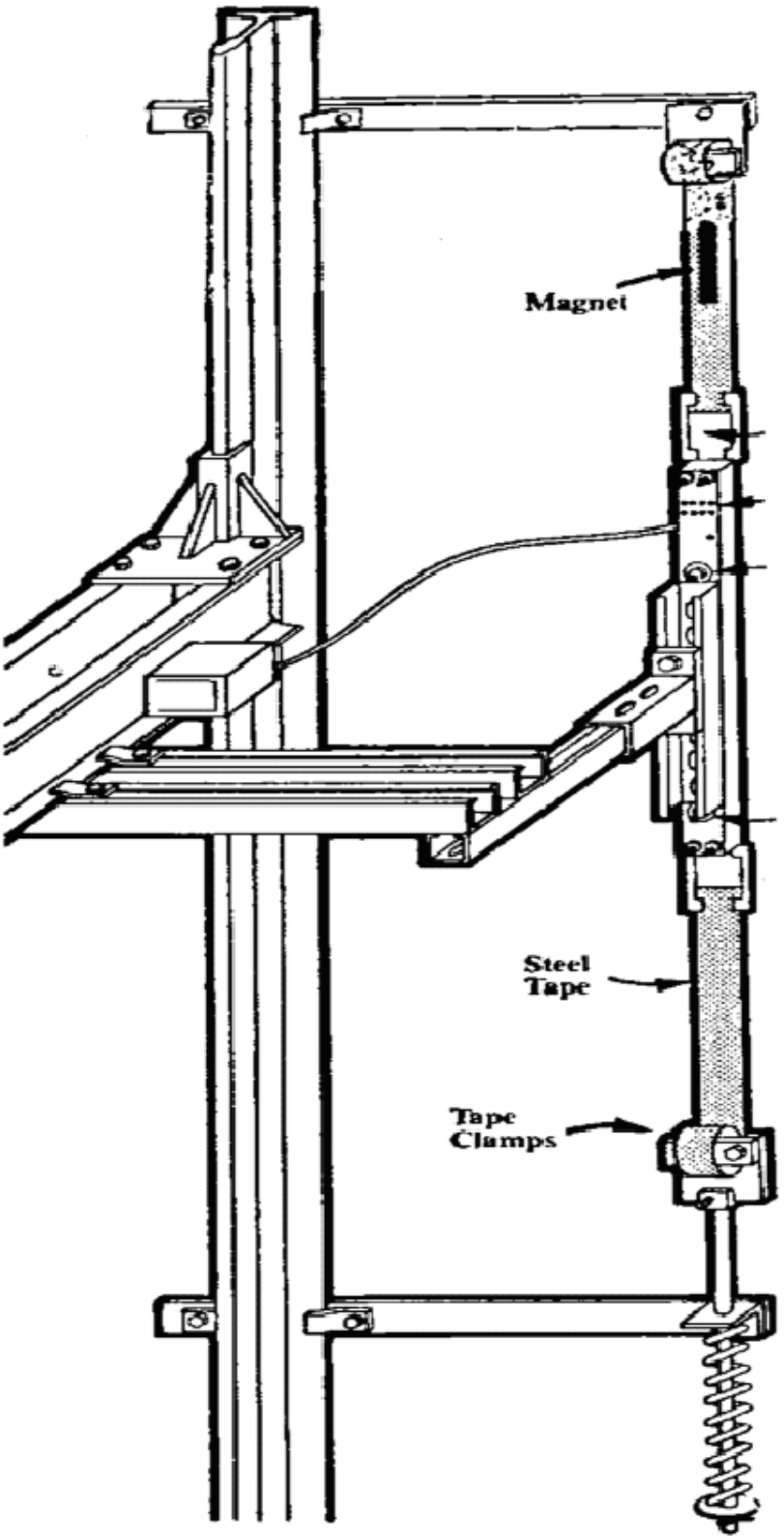
Speed FPM	*50 FPM*	*75 FPM*	*100 FPM*	*125 FPM*	*150 FPM*	*200 FPM*
Deceleration length	12 in	18 in	24 in	30 in	36 in	48 in
B	1 in	1 in	1 in	1 in	1 in	1 in
C	7 in	11 in	17 in	23 in	29 in	41 in
D	9 ¼ in	13 ¼ in	19 ¼ in	25 ¼ in	31 ¼ in	43 ¼ in
E (Magnet length)	5 in	8 in	12 in	12 in	12 in	12 in

USL: Up deceleration magnet
DSL: Down deceleration magnet
N: North magnet
S: South magnet
DZO: Door zone magnet

The "DZO" and "PFP" lights must be "ON" and "LU" and "LD" lights must be "OFF" when the car is centered in the door zone.

Before putting the elevator in automatic mode, move the elevator in inspection at the bottom and the top of the hoistway for the learning of the main floor.

Standard tape selector installation:



4.2. USING A PERFORATED TAPE SELECTOR:

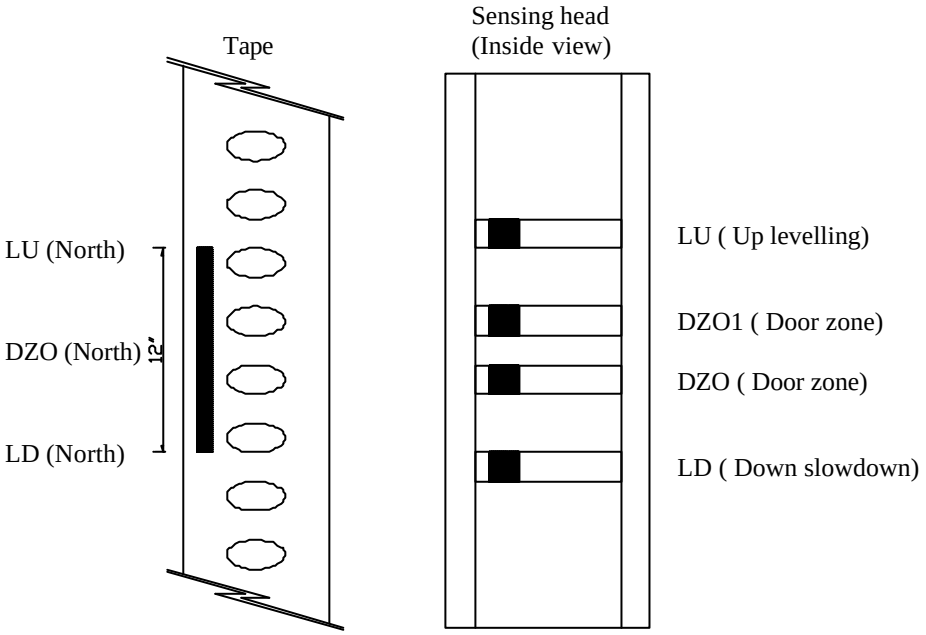
There are no magnets on the tape for the position control and the slowdown activation. The PLC high-speed counter counts holes in the tape. The tape has 16 holes per foot. To initiate slowdowns, it is only necessary to specify how many holes the elevator needs to decelerate and stop at the floor. This number is the same for each floor.

The PLC and the perforated tape reader are maintained with a battery backup for when the main power switch is opened. Therefore, if an electrical power failure occurs, no counts are lost during the car stops.

4.2.1. Installation:

To indicate the positions of the door zone and the levelling, a magnet must be installed on each floor to the left side of the tape. The first requirement is to install magnets at each floor.

Position the car at the exact same level of the landing. Position the magnet on the tape so that the sensor "DZO" and "DZO1" is activated but sensors "LU" and "LD" remain de-activated; that is, position the magnet exactly centered between "LU" and "LD"



4.2.2. Programming the number of holes for slowdown:

The recommended distance for correct slowdown before arrival at a given floor is 6 in for each 25 FPM.

Example:

200 FPM X 6 in = 48 in
25 FPM

Tape 16 holes/ft = 1 hole/0.75 in

Therefore: 48 in = 64 holes
0.75

Slow down distance table:

? 100 FPM = 24 in = 32 holes

? 125 FPM = 30 in = 40 holes

? 150 FPM = 36 in = 48 holes

? 200 FPM = 48 in = 64 holes

? 225 FPM = 54 in = 72 holes

? 250 FPM = 60 in = 80 holes

? 300 FPM = 72 in = 96 holes

? 350 FPM = 84 in = 112 holes

? 400 FPM = 96 in = 128 holes

Elevators reaching the contractual speed between each level (Elevators 250 FPM and less):

In DM132, enter the number of holes for slowdown before arrival at a floor.

Elevators with a floor to floor speed and a two floors speed and more (Elevators 300 FPM and more):

Enter the number of holes for slowdown before arrival at a floor:

? In DM132 for a one floor run.

? In DM133 for a high speed run.

Using console C200H-PRO27 or CQM1-PR001-E or LCD (See appendix C) programming tool type in:

CLR	MONTR	CLR	DM	132	MONTR	CHG

	Screen =	PRES. VAL? DM132 0000????	
Write down the desired number of holes(ex: 91)		9	1	WRITE

The number of holes can be changed at any time when the car is stopped.

4.2.3. Verification of the right direction for high speed counter with perforated tape:

Before recording floor positions, the "PLC" high-speed counter must count in the right direction.

Using console C200H-PRO27 or CQM1-PR001-E or a LCD (See appendix C) type in:

CLR	SHIFT	CH *	0230	MONTR
	SHIFT	CH *	0231	MONTR

The screen displays channels 231 and 230 at the same time. The high-speed counter counts from -32 767 up to +32 767 passing zero (0).

-32 767		✍ ------- 0 --------✍		+32 767	
F003	2767	0000	0000	0003	2767
CH 0231	CH 0230	CH 0231	CH 0230	CH 0231	CH 0230

If an F appears on the left side of the screen, the counter is negative. Therefore, the value must decrease to reach 0. If 0 appears on the left side of the screen, the counter is positive and the value must increase.

Activate the "PCH" signal to run the car up in inspection mode. The displayed value must become increasingly positive. If this is not the case, reverse the signals "HT1" and "HT2".

4.2.4. Recording floor positions using perforated tape:

? Ensure that the levelling magnets are correctly installed on each floor. Refer to section 4.2.1.

? The controller has to be in "INSPECTION" mode.

? Using console C200H-PRO27 or CQM1-PR001-E or a LCD (See appendix C) type in:

CLR	MONTR	CLR	DM	492	MONTR	CHG

Screen = PRES. VAL? DM492 0000????

Write 1234 | 1 2 | 3 4 | WRITE |

? At this time, the output "FLOOR SETTING" of the PLC is blinking. The value of DM492 will stay "1234" as long as the learning process will not be completed. To interrupt the learning process at any time, type "0" in the DM492 or put the elevator in normal mode for a few moments.

? Lower the car to the bottom landing so that the normal down limit (LNB) and "LU" sensor are activated. At this time, the car must be a little lower than the level of the bottom landing.

? Move the car up in inspection speed until the normal up limit (LNH) is activated.

Make sure that the normal down limit (LNB) is disengaged before LU (up levelling). "LNB" input on the PLC must be on before the "LU" input is turned off.

The register DM483 allows to follow the learning floor positions. It increases by 1 each time a floor position is memorized. Therefore, at the end of the learning position this register is supposed to show the number of floors. If the elevator stops at the top floor but the output of the PLC still blinking, it is because one or some floors are not memorized. Verify the normal limits at the top and the bottom, and redo the record.

If all the floors are registered and that the exit is no longer blinking, the position of each floor, the number of pulses from the bottom to top, is recorded permanently in the processor.

Run the car in inspection mode. The position indicator will increase or decrease according to the position of the car, if the number of holes for slowdown has been entered as described in section 4.2.2.

If the indicator does not operate correctly, repeat this procedure.

At this time, the elevator is ready for operation in automatic mode. The perforated tape floor or the encoder recording is completed.

4.3. PRINCIPLE WITH STANDARD TAPE SELECTOR AND GOVERNOR ENCODER:

There are no magnets on the tape to control the zones and to start the decelerations; the encoder pulses control thoses sequences. The encoder has 50 pulses per turn when it is installed at the center of the governor wheel, which corresponds to the same resolution as the perforated tape

(3/16 po). The installer only has to specify the number of pulses before reaching a floor to start the decelerations. This same number of pulses will be used for each floor.

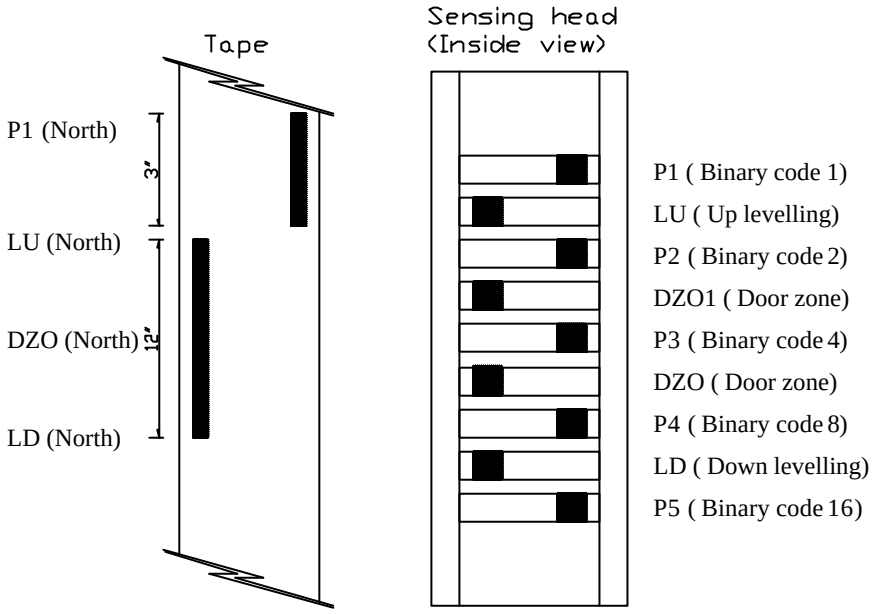
The pulse count is supported by a battery to ensure that, in the occurance of a power failure, there are no count loss whilst the car is travelling.

4.3.1. Positioning:

Tape selector:

It is necessary to install a magnet at each floor, on the left of the tape, to indicate the position of the door zone and of the levelling device. It is important to begin by placing these magnets at each floor.

Manually place the car even with the floor (with precision). Place the magnet on the tape so that DZO and DZO1 are activated but not LU and LD (centered between LU and LD).



Governor encoder:

Erreur ! Des objets ne peuvent pas être créés à partir des codes de champs de mise en forme.

Connection:

? Turn off the power and install the encoder on the shaft located in the center of the encoder.

? Once this is done, use the same pipe-line as the governor dry contact to run the encoder wire provided with the controller.

? Connect the wires between terminals HT1, HT2, +24 and 0V (see drawings).

4.3.2. Programming the number of pulses for the deceleration:

The distance recommended to obtain a good deceleration before reaching a floor is 6 in per 25 FPM.

Example:

$$\frac{200\ FPM \times 6in}{25\ FPM} = 48in$$

The encoder has 16 pulses/ft = 1 pulse/0.75in

$$So: \frac{48\ in}{0.75} = 64\ pulses$$

Decel. Distances Table:

? 100 FPM = 24in = 32 pulses

? 125 FPM = 30in = 40 pulses

? 150 FPM = 36in = 48 pulses

? 200 FPM = 48in = 64 pulses

? 225 FPM = 54in = 72 pulses

? 250 FPM = 60in = 80 pulses

? 300 FPM = 72in = 96 pulses

? 350 FPM = 84in = 112 pulses

? 400 FPM = 96in = 128 pulses

Elevators reaching a contractual between each floor (Elevators 250 FPM and less):

Write in the DM132 the number of pulses (before reaching the floor) necessary for the deceleration.

Elevators with a floor to floor speed, and a two floor and more (Elevators 300 FPM and above):

Write the number of pulses (before reaching the floor) necessary for the deceleration in:

? DM132: for one floor runs:

? DM133: for a faster speed.

Using the C200H-PRO27 (CQM1-PRO01-E) or LCD (See appendix C) programming tool, do:

CLR	MONTR	CLR	DM	132	MONTR	CHG

Screen =

PRES. VAL? DM132 0000 ????

Write the desired number of pulses(ex: 91)	9	1	WRITE

The number of pulses can be modified at any time when the car is stopped.

4.3.3. Verifying the direction of the counts from the fast counter using the governor encoder:

Before recording floor positions, ensure the fast counter is counting in the correct direction.

Using the C200H-PRO27 (CQM1-PRO01-E) or LCD programming tool, do:

CLR	SHIFT	CH *	0230	MONTR
	SHIFT	CH *	0231	MONTR

The screen shows channels 230 and 231 at the same time. The fast counter is counting from – 32,767 to +32,767 while passing by 0.

-32 767 ✍ ------- 0 --------✍ +32 767

F003	2767	0000	0000	0003	2767
CH 0231	CH 0230	CH 0231	CH 0230	CH 0231	CH 0230

If there is an "F" on the left side of the screen, it means the count is negative. Hence, the value must decrease towards 0. if there is a 0 on the left side of the screen, it means the count is positive. Hence, the value must increase.

Activate the PCH signal to make the car go up in inspection mode. The value should increase. If not, invert the HT1 and HT2 signals.

4.3.4. Recording floor positions using the governor encoder:

? Ensure the 12in magnets (door zone) are installed correctly at each floor, as described in section 4.3.1

? The elevator controller must be in inspection mode.

? Using console C200H-PRO27, or CQM1-PR001-E or LCD (See appendix C) Type in:

CLR	MONTR	CLR	DM	492	MONTR	CHG

Screen =

PRES. VAL? DM492 0000????

Write 1234

1 2	3 4	WRITE

? At this time, the output "Floor Setting" should start to blink. The value of DM492 will stay "1234" as lond as thew floor learning will not be completed. To interrupt the position learning process at any time, type "0" in the DM492 or put the elevator in normal mode for a few moments.

? Move the car to the lowest level in order to activate the down normal limit switch (LNB) and LU. At that moment, the car should be slightly below the bottom floor.

? Move the car up in inspection speed until the Up normal limit switch (LNH) is activated.

Ensure the down normal limit switch (LNB) deactivates before LU. The LNB input on the CPU must light up before LU turns off.

The DM483 register allows to show the floor position learning process. The register increases of one unit each time a floor is recorded. So, at the end of the learning process, the value in the register should equal the number of floors serviced by the elevator. If the elevator stops at the top floor and the output continues to blink, it means one or several floors were not recorded correctly. Verify the positioning of the up and down normal limit switches and start over.

If all floors are registered and the exit light is no longer blinking, the position od each floor, the number of pulses from the bottom to top, is recorded permanently in the processor.

Move the car in inspection mode. The position indicator should go up or down if the number of pulses for the deceleration was entered, as described in section 4.3.2.

If the indicator does not function properly, start over this section.

The elevator is now ready to be switched to the automatic mode.

4.4. HIGH SPEED COUNTER VERIFICATION:

The PLC register "DM490" shows the actual elevator position in holes from the "LNB" limit switch.

At each floor stop, the recorded floor position is downloaded in the high-speed counter.

Count loss

When the elevator is in the levelling portion just before the floor stop, the "DM490" value increases or decreases slowly. When the elevator stops at the floor, observe the value that will be moved in the register after 2 seconds. If the value changes for more than 2 counts, which can indicate a count loss or that the recorded floor position is not correct.

Record the entire floor positions another time and if the problem is still present, verify "HT1" and "HT2" shield. Cleaning the tape reader can solve the count loss problem.

WARNING

Day light or high power lights generate infrared rays that can affect the perforated tape reader.

4.5. "BAR CODE" MAGNETS INSTALLATION ON EACH FLOOR:

The tape reader on the top of the car has 4 or 5 sensors that let you confirm the exact floor at each stop.

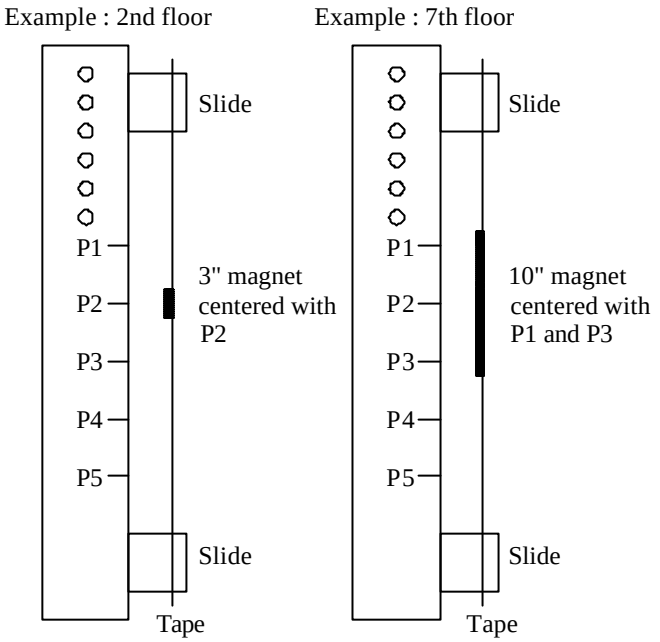
The table here under explains how to install the magnets and holds a table for a bar code up to 31 floors.

The bar code is a protection for the new B44-00 code.

4.5.1. Using magnets of 3,7,10,13 and 17" without the JRTGabarit (IP1200-TP1):

Binary code / Level	MAGNETS REQUIRED FOR BINARY CODE P1	P2	P3	P4	P5	Nbr.	Length (in)
1	☞					1	3
2		☞				1	3
3	☞	☞				1	7
4			☞			1	3
5	☞		☞			2	3
6		☞	☞			1	7
7	☞	☞	☞			1	10
8				☞		1	3
9	☞			☞		2	3
10		☞		☞		2	3
11	☞	☞		☞		1	7 and 3
12			☞	☞		1	7
13	☞		☞	☞		1	7 and 3
14		☞	☞	☞		1	10
15	☞	☞	☞	☞		1	13
16					☞	1	3
17	☞				☞	2	3
18		☞			☞	2	3
19	☞	☞			☞	1	7 et 3
20			☞		☞	2	3
21	☞		☞		☞	3	3
22		☞	☞		☞	1	7 and 3
23	☞	☞	☞		☞	1	10 and 3
24				☞	☞	1	7
25	☞			☞	☞	1	3 and 7
26		☞		☞	☞	1	3 and 7
27	☞	☞		☞	☞	2	7
28			☞	☞	☞	1	10
29	☞		☞	☞	☞	1	3 and 10
30		☞	☞	☞	☞	1	13
31	☞	☞	☞	☞	☞	1	17

☞: Detectors should be activated + red led in the jonction box.



P1, P2, P3, P4, P5 = sensors located in the tape selector.

North magnets need to be used. The binary code is only validated when sensors are switched on and the elevator is centered to the floor (DZO = ON, LU = OFF, LD = OFF). These magnets allow correcting the elevator's position. The right position of these magnets is important.

WARNING

For group or triplex, if the elevator does not go to the lower floors, the bar code will have to start at the same level than the car calls.

Example: Car calls to the elevator B start from the third floor, 3Z. The bar code starts at level 3, where only P1 and P2 are activated.

4.5.2. Guide locating the magnets DZO and P1 to P5:

Automatisation JRT inc. has developed a guide that allows you to locate rapidly the magnets of the doors zones (DZO) and the magnets of the binaries codes (P1 to P5).

Procedure:

? Position the elevator even to the floor.

? Position the row guide as shown in figure 1.

? Lower the car and position the magnet guide supplied as in figure 2.

? Position the JRT template (IP1200-TP1) under the Red North magnet as in figure 3.

? Stick the magnet DZO in the reserved space of the JRT template.

? Stick the magnets P1 to P5 for the binary code in accordance with the floor selected, the Template indicates which magnet to stick in accordance with the floor selected. Example for the 1st floor, only the magnet P1 has to be stuck. For the 3rd floor, the magnets P1 and P2 must be stuck.

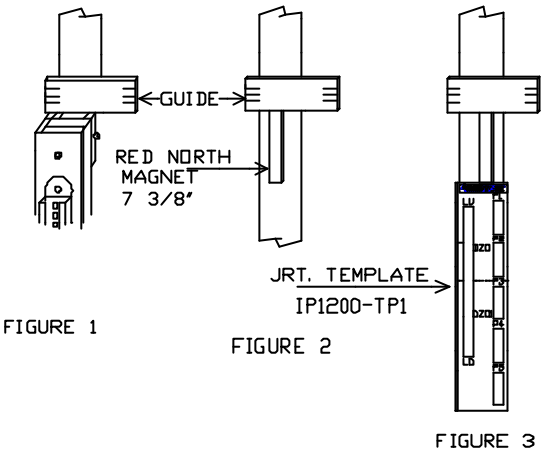


FIGURE 1

FIGURE 2

FIGURE 3

	MAGNETS REQUIRED FOR THE BINARY CODE						
Binary Code / Level	P1	P2	P3	P4	P5	Nbr.	Length (inches)
1	☞					1	3
2		☞				1	3
3	☞	☞				2	3
4			☞			1	3
5	☞		☞			2	3
6		☞	☞			2	3
7	☞	☞	☞			3	3
8				☞		1	3
9	☞			☞		2	3
10		☞		☞		2	3
11	☞	☞		☞		3	3
12			☞	☞		2	3
13	☞		☞	☞		3	3
14		☞	☞	☞		3	3
15	☞	☞	☞	☞		4	3
16					☞	1	3
17	☞				☞	2	3
18		☞			☞	2	3
19	☞	☞			☞	3	3
20			☞		☞	2	3
21	☞		☞		☞	3	3
22		☞	☞		☞	3	3
23	☞	☞	☞		☞	4	3
24				☞	☞	2	3
25	☞			☞	☞	3	3
26		☞		☞	☞	3	3
27	☞	☞		☞	☞	4	3
28			☞	☞	☞	3	3
29	☞		☞	☞	☞	4	3
30		☞	☞	☞	☞	4	3
31	☞	☞	☞	☞	☞	5	3

☞: Detector should be activated + DEL red in the jonction box

P1, P2, P3, P4, P5 = Detectors located in the tape selector.

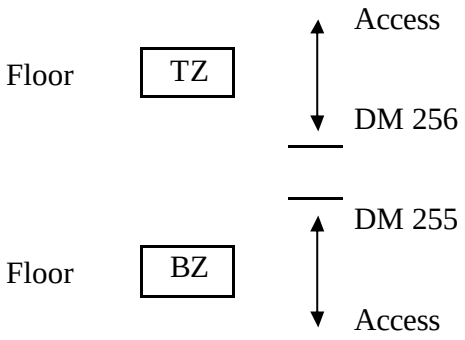
The magnets are "North" type. The binary code is validated only when the detectors are on and when the elevator is centered to the floor (DZO = ON, LU = OFF, LD = OFF). Those magnets allow to correct the elevator position, therefore it is important to position the magnets correctly.

IMPORTANT

For the "duplex" and group elevators, if the elevator doesn't go to defined floors, the binary code must not be used.

Example: The calls for the cabin of the elevator B of a duplex start at 3Z. The binary code must start at the third level, which is P1 and P2 activated, the binary code of the first and second floor must not be used.

4.6. HOISTWAY ACCESS TRAVEL ADJUSTMENT:



The controller allows to limit the hoistway access of travel to the bottom and top floors, avoiding the installation of mechanical limits

DM 255: Number of holes limiting the travel zone at bottom floor end of the building. (16 holes/ft)

DM 256: Number of holes limiting the travel zone at the top floor of the building. (16 holes/ft)

Example:

To modify the size of the zone, press:

CLR	DM	2	5	5	MONTR
CHG	XXXX	WRITE			

5. MOTOR/GENERATOR START UP:

5.1. PREPARATIONS BEFORE APPLYING POWER TO THE CONTROLLER:

5.1.1. Motor field winding connection:

The current relay that monitors the motor field is generally set up for a capacity of 5 amps (10 amps optional). It is very important to choose the good DC motor field connections to avoid damage to the unit.

To measure the winding resistance, disconnect one field wire. Never read the resistance when two wires are connected in the controller. The value will be erroneous.

Example:

80 volts = 5.33 amps running current
15 Ohms measured with your meter

The measured running voltage allows to find the running current in the motor field.

In this example, the running current is very high. During the approach to the floor, a higher current will be send and can damage the RMC relay. In this situation, you should change the motor field connections to put the 2 windings in series.

If the current obtained with 80 volts is less than 2.0 amps, repeat the same formula with 160 volts applied to motor field. The motor fields are probably in series.

If the windings are already in series with a current of 5.33 amps, the RMC relay has a small current selector that needs to be switched to a higher scale.

Example:

80 volts = 3.2 amps running current
25 Ohms measured with your meter

In this example, the running current is acceptable. During the approach to the floor, a higher current will be applied, but will not exceed 5 amps.

The drawings furnished with the controller represent the motor field connection in series or in parallel. You must always verify the current with the above formula.

"TAP" selection on the control transformer:

Example:

80 volts = 3.2 amps running current
25 Ohms measured with a meter

In this example, the running current is at 3.2 amps. The forcing current in leveling will be 1.25 X 3.2 amps = 4.0 amps.

The maximum voltage that will be needed is:

25 Ohms X 4.00 amps = 100 volts D.C.

The 110 volts AC "TAP 2will be enough to output 100 volts DC in leveling. To change the supply voltage, move the wire that feeds the "SCRM" module "AC 2" terminal to the 110 volts AC "TAP".

Repeat the above formula with the measured value of your motor field and select the transformer AC voltage.

5.1.2. Generator field winding connection

The IPC field regulation card can output 7.5 amps maximum. It is very important to choose the good generator field connections to avoid damage to the unit. Never exceed 7.0 amps.

Generally, the maximum generator exciting voltage read with a meter is between 60 to 90 volts at full speed and full load.

The generators have several windings:

Running field: Between 20 and 50 Ohms

Leveling field: Between 200 and 300 Ohms

Only the running field will be used. Wire the running field on terminals: "GF1" and "GF2".

The leveling field will only be used if the elevator has problems to reach the contract speed with a current less than 7.0 amps. This one will be connected in parallel with the running field if required.

Unused leveling field wires need to be isolated and be sure they will not touch anything.

To measure the generator winding resistance, disconnect one lead. Never read the resistance when the 2 wires are connected in the controller. The value will be erroneous.

Estimate a running exciting voltage at 75 volts normally.

Example:

75 volts during running = 2.7 amps running current
27 Ohms measured with your meter

The 75 volts running voltage allows to find the generator field current output by the IPC card. In this example, the running current is very acceptable. When the elevator will be in leveling, the current will not exceed 7.0 amps.

However, if the computed current is above 7.0 amps, you must change the generator field connections and put the windings in series.

If the computed current with 75 volts running is less than 2.0 amps, repeat the above formula with 150 exciting volts. The generator field is probably in series.

"TAP" Selection on the control transformer:

Example:

75 volts running + 30 volts (elevator full load)

You must always assume 30 to 40 volts more to have enough voltage when the elevator is full charge.

The maximal voltage required will be 105 volts. To change the IPC card field supply voltage, move the wire that goes to "FP1" terminals on the card to the 110 volts AC "TAP".

Repeat the above formula with the measured value of your motor generator field and select the transformer output AC voltage.

5.1.3. Generator armature connection:

The generator series field is not used with the close loop system. This winding has to be isolated and be sure that the 2 leads will not touch anything. The motor "interpoles" have to stay connected with the armature.

5.1.4. Motor armature connection:

Connect motor armature and "interpoles" leads like shown on the drawings. Reversing the motor field if necessary can change the motor rotation.

5.1.5. AC generator motor connections:

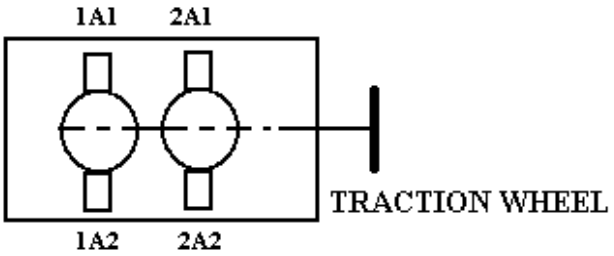
The star/delta AC generator motor connection are done on T1 to T6 terminals according to the drawings.

CAUTION: Be sure that the generator rotation is in the same direction of the small arrow stamped on the generator side.

5.1.6. Tachometer connections

The IPC generator field regulator needs to know the real motor speed to regulate the elevator speed. The generator field exiting voltage should never exceed 150 volts at any speed.

The tachometer supplied has 2 separated windings and each one generates 60 volts at 1000 RPM.



Tachometer installed on the motor shaft:

Usually, the tachometer is installed at the motor shaft end. The tachometer has the same speed as the motor shaft.

Normally, elevator motors run at about 1200 RPM at contract speed.

So, 60 Volts = 1000 RPM

X volts = 1200 RPM

60V * 1200/1000 = 72 volts.

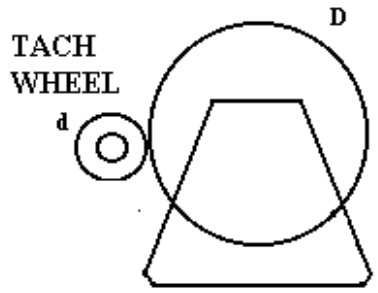
For a good speed regulation, a minimum of 25 volts must be generated when the elevator moves at contract speed.

To install the tachometer at the end of the motor shaft, a small piece has to be built. A small hat with 2 holes at the base allows to center easily the tachometer shaft.

Sometimes, the motor end has a hole with threads. Never use these threads. The tachometer aligment will be practically impossible.

A coupling will be required to joint both shafts.

Tachometer installed on the cable sheave



In some cases, it could be impossible to install the tachometer on the motor shaft. A small wheel could be mounted on the tachometer shaft and with a spring system that small wheel runs on the big sheave.

Measure the tachometer wheel diameter

Example:

Elevator Speed = 200 FPM
d = 3.25 inches

Simplified formula:

$$\text{So, FPM} = \frac{\text{* 12 inches}}{\text{3.1416 * d}} = \frac{\text{200 FPM * 12}}{\text{3.1416 * 3.25}} = \text{235 RPM}$$

*235 RPM * 60 volts/1000 turns = 14.1 volts Not enough voltage*

With 2 windings in series

*235 RPM * 120 volts/1000 tuns = 28.2 volts*

For a 200 FPM elevator, the 2 windings have to be placed in series to obtain the minimum voltage required for the speed regulation. In this example, the tachometer wheel diameter should not be higher than 3.25 in.

If the 2 windings have to be placed in series, join "1A2" with "2A1". The signal will be measured between "1A1" and "2A2".

The tachometer-shielded wire must be in a separated pipe to prevent electrical interference. This conductor must have an overall shield. The shield end goes to the "SHD" terminal in the elevator controller. At the other end, the shield must isolated.

5.2. ELEVATOR DC MOTOR OVERLOAD ADJUSTMENT (GOL):

The motor overload relay contains oil inside. Write down the full load DC armature current from the nameplate.

Determines the horizontal bar corresponding to 125% armature current.

Refer to the next 2 pages for the overload adjustment.

5.2.1. If bimetal overload:

The overload relay is already adjusted by a heater that reacts to heat. This heater was determined according to the DC motor current.

There are existing Class 10 (Type K) heaters with faster release.

There are existing Class 20 (Type E) heaters with slower release.

It is important to configure the overload relay to obtain a manual reset. (See chart on the side of the overload relay)

5.2.2. If oil overload:

The oil surcharge relay as a chart on the side. Pull up the field current on the motor name plate.

Determine which horizontal bar corresponds to 125 % of the field current.

Refer to the next 2 pages for the overload adjustment.

Page 1 AB:

BULLETIN

INSTRUCTIONS | 810

INVERSE TIME CURRENT RELAYS — SERIES B

IMPORTANT — Save for future reference.

DESCRIPTION — The Bulletin 810 is a magnetically operated current relay, with time delay, for use on AC or DC applications. It has inverse time-current characteristics which are dependent upon the viscosity of the fluid in the dashpot. However, unlike thermal relays, minimum operating current is independent of ambient temperature change or cumulative heating. The relays are supplied as standard with a normally closed (NC) contact and an automatic reset. Available options are a normally open (NO) contact, hand reset, and bifurcated contacts with a clear plastic (polycarbonate) cover. Tripping current and time delay are adjustable.

CONTACT RATINGS — A600

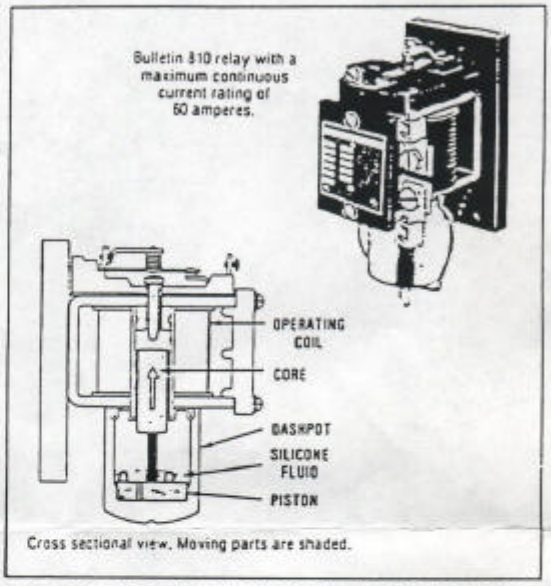
A.C. Control Circuit	Maximum Break	Maximum Make	D.C. Control Circuit	Contact Rating
120-600 V	720 VA	7200 VA	115-125 V	0.4 A
			230-250 V	0.2 A
6-72 V	10 Amp.	10 Amp.	500-600 V	0.1 A

TIME DELAY TRIP — Current relays are used when it is desirable to take a motor off the line in a certain period of time after a predetermined load condition is reached. A typical application would be starting a large motor, where the Bulletin 810 is used to automatically open the motor starter control circuit if the motor is not up to speed in the maximum acceleration time allowed. In this and other applications of the automatic reset type relay, three wire control must be used, with a provision for interrupting the current through the relay coil immediately after the relay trips (see typical schematic diagram on page 2). On two wire control applications such as float switches, pressure switches or thermostats, a hand reset type overload relay must be used to provide this protection to the coil. The relay can carry its rated continuous current in the non-tripped position only.

OPERATION — Current through the Bulletin 810 operating coil imparts an electromagnetic force on the movable core. The vertical position of the core in the coil is adjustable, thereby providing an adjustable trip point. When the coil current increases to the trip point, the core raises to operate the contact mechanism. Time delay is provided by a silicone fluid dashpot mounted below the core and coil assembly. An adjustable valve in the dashpot piston provides for time delay adjustment.

NORMAL CURRENT — The electromagnetic force caused by normal continuous current through the operating coil is not great enough to lift the core and piston. The relay remains inoperative.

OVERCURRENT — When the current through the operating coil increases beyond the trip point, the resultant electromagnetic force causes the core and piston to raise. Upward motion is dampened through the use of the silicone fluid dashpot. The core rises slowly until the piston reaches an increased diameter in the dashpot, where it is free, to trip the contact with a quick action. Time and current required to complete this cycle are inversely related as shown by the time-current characteristics curves on page 2.



Cross sectional view. Moving parts are shaded.

RESET — Standard models of the Bulletin 810 are automatically reset as soon as the current through the coil is interrupted or decreased to approximately 20% of the tripping current. The core is designed to drop quickly, returning the contacts to their normal position. A check valve allows the piston to bypass the fluid in its return to the bottom of the dashpot. The action of hand reset models differs only in that the contacts do not reset until a lever on the contact block is operated. There is no waiting period as with thermal relays.

EFFECTS OF AMBIENT TEMPERATURE — The minimum operating current (100% on the time-current characteristics graph) is independent of ambient temperature at the relay. However, the operating time at overcurrent varies directly to the viscosity of the silicone fluid. Since the viscosity varies inversely with ambient temperature, the operating time is also inversely affected. The time temperature table shows the correction factors to be applied to the operating times for various temperatures.

TIME TEMPERATURE RELATIONSHIP (+40°C Reference) —

Ambient Temperature (°C)	0°	+10°	+20°	+30°	+40°
Operating Time Correction Factor	2.25	1.80	1.45	1.20	1.0

ALLEN-BRADLEY
A ROCKWELL INTERNATIONAL COMPANY
Cambridge, Ontario

Publication 810-5.0C — June, 1983
Supersedes Instructions 810-800C — October, 1978

Page 2 AB:

OPERATING CURRENT ADJUSTMENT — (Not necessary if factory set to user's specified value). The minimum operating current (100% on the time-current characteristics graph) is adjusted by changing the vertical position of the core within the operating coil. Calibration lines on the core correspond to current values in the table below and stamped on the nameplate. After the core and dashpot assembly is removed, the core is turned up or down on the piston's threaded stem till the line corresponding to the desired operating current is in line with the top edge of the dashpot. Currents other than those indicated by the lines are possible by interpolation.

NOTE: If electrical tests are made of current calibrations they should be done without fluid in the dashpot (clean and dry).

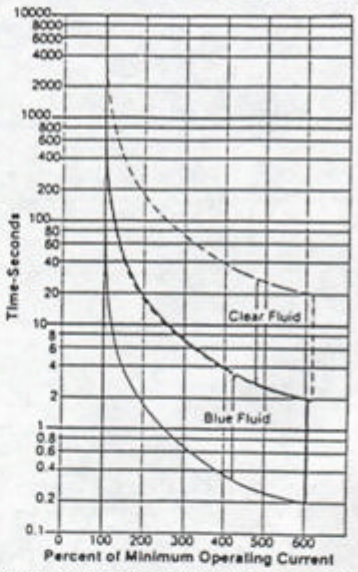
ADDING DASHPOT FLUID — (See note above) The dashpot fluid is shipped separately. To add fluid remove the core and dashpot assembly by unfastening the spring clamp. Remove the dashpot cover by pulling the core straight out of the dashpot. Remove and discard red plastic shipping spacer if present. Add the silicone fluid with the dashpot cover removed, with the piston and core in place. Fill the dashpot to the top of the three round projections on the piston. See illustration below. The fluid must be free of dirt or grit, and the dashpot and piston must be absolutely clean. Check fluid level periodically.

OPERATING TIME ADJUSTMENT — Unless ordered with a specified time delay setting, the relays are set for minimum time delay when shipped. To increase the time delay, remove the piston from the dashpot and decrease the opening of the adjustment valve by rotating its cover counterclockwise. See illustration below.

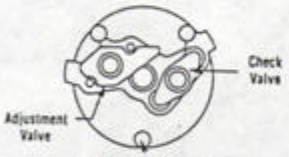
CAUTION: Do not attempt to change the position of the check valve cover, which holds the steel balls of the check valve in place.

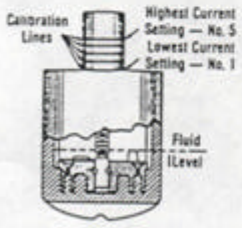
The range of operating times possible with the Bulletin 810 is shown by the time-current characteristics curves to the right. The area labeled "blue fluid" represents the range of curves possible using the standard fluid supplied with the relay. Higher viscosity "clear" fluid will be supplied when requested. Each area is bounded by curves that represent the operating times with the valve fully opened and fully closed. Intermediate settings must be verified by electrical tests.

TIME-CURRENT CHARACTERISTICS AT +40°C



COIL CURRENT — The maximum continuous current rating of the coil appears on the relay nameplate. The current at which the relay is set to trip should not exceed this value except when an additional device protects the coil against sustained overcurrent. To avoid relay damage, current through the relay coil must be interrupted after the relay trips. Relay can carry rated continuous current in the non-tripped position only.



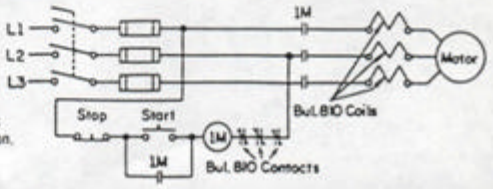


Max. Continuous Coil Current Amps.	Catalog Number [1]	AC Calibrations					DC Calibrations					Coils 600V Max. 60 Hz Max.
		1	2	3	4	5	1	2	3	4	5	Part No.
2	810-A01A	1.1	1.5	2.0	2.6	3.1	0.95	1.4	1.9	2.3	2.8	X-67400
3	A02A	1.6	2.3	3.0	3.8	4.5	1.4	2.1	2.9	3.5	4.3	X-67404
4	A03A	2.1	3.0	4.0	5.1	6.1	1.9	2.9	3.8	4.7	5.7	X-67407
6	A04A	3.2	4.5	6.0	7.6	9.1	2.8	4.3	5.7	7.0	8.5	X-67415
9	A05A	4.8	6.8	9.0	11.4	13.6	4.2	6.4	8.5	10.5	12.8	X-67420
12	A06A	6.3	9.0	12.0	15.2	18.1	5.7	8.5	11.4	14.0	17.0	X-67425
16	A07A	8.5	12.0	16.0	20.5	24.0	7.6	11.3	15.1	18.6	22.7	X-67429
20	A08A	10.5	15.0	20.0	25.5	30.0	9.4	14.1	18.9	23.2	28.3	X-67433
28	A09A	15	21	28	36	43	13	20	27	33	40	X-67439
40	A10A	21	30	40	51	61	19	29	38	47	57	X-67444
48	A11A	25	36	48	61	72	23	34	46	56	68	X-67454
56	A12A	30	42	56	72	85	27	40	54	66	80	X-67457
72	810-A14A	38	54	72	91	108	34	51	68	84	102	X-86996
100	A16A	53	75	100	126	150	47	71	94	116	141	X-87001
120	A18A	68	97	130	165	195	61	92	123	151	184	X-67480
144	A21A	76	108	144	183	217	68	102	136	167	204	X-88198
210	A24A	114	162	216	274	325	102	153	204	250	305	X-88195
320	A27A	171	242	328	411	488	152	229	306	376	458	X-90711

[1] Catalog numbers are for single relays in the open type construction, with NC contacts and an automatic reset. The calibration table also applies to catalog numbers beginning with the letter B, C, K, or L, and ending with the letter B, C, or D.

TYPICAL SCHEMATIC DIAGRAM

Three Bulletin 810 relays used for overload protection.



5.3. MOTOR FIELD VOLTAGE ADJUSTMENT:

The elevator controller has a switch to stop the MGS ET system.

Before applying power to the controller:

? The motor field current relay "RMC" must be adjusted on the proper amps scale according to your calculations (5 amps or 10 amps).

? Be sure that the switch "RUN/STOP" in the controller is at the "STOP" position.

? The motor field control has 3 potentiometers: "levelling", "running" and "standing".

✍ Shut down the elevator power and disconnect one motor field wire.

✍ Pulls out these relays from there sockets: "FF", "NA" et "ML2".

✍ Turn on the power to the controller.

Motor field voltages can be adjusted without the field connected. However, these 3 voltages will have to be verified when the motor field will be connected at the end of that section.

Measured motor field resistor (Ohms).

Voltages adjustment:

The motor field voltage must be read between terminals "MF1" and "MF2".

Example:

80 volts running = 3.2 amps running current
25 Ohms measured with your meter

In this example, the running current is 3.2amps. The levelling current will be 1.25 X 3.2 amps = 4.0 amps.

So, 25 Ohms measured with your meter X 4.00 amps = 100 volts D.C. in levelling.

If "JRT-CHAMPS-MOTEUR" scr control pc board:

Levelling voltage: Put a jumper between terminals 7 and 9 on the card and turn the "LEVELING" potentiometer up to maximum calculated voltage. Once done, remove the jumper from terminals 7 and 8.

Running voltage: place a jumper between the terminals 7 and 8 on the card and turn the "RUNNING" potentiometer to 80 or 160 volts according to your calculations. Once done, remove the jumper from terminals 7 and 8.

Standing voltage: Place a jumper between the terminals 8 and 9 on the card, and turn the "STANDING" potentiometer to 40 volts or 80 volts according to your calculations. Once done, remove the jumper from 8 and 9.

If 0-15 volts analog system with 3 potentiometers "PTR-1000":

Levelling voltage: Put a jumper between the terminals "RFF" and "SIG" and turn the "LEVELING" potentiometer up to maximum calculated voltage. Once done, remove the jumper.

Running voltage: Place a jumper between the terminals "RML" and "SIG" and turn the "RUNNING" potentiometer to 80 or 160 volts according to your calculations. Once done, remove the jumper.

Standing voltage: Place a jumper between the terminals "RNA" and "SIG" and turn the "STANDING" potentiometer to 40 volts or 80 volts according to your calculations. Once done, remove the jumper.

CAUTION

Running voltage higher than necessary:

The measured generator field voltage will be less than normal. The elevator will have some problems to reach contract speed.

Running voltage excessively high:

The measured generator field voltage will be higher than normal. The elevator will have some problems to reach contract speed. Bumps will be felt in the elevator.

Running voltage to low:

The motor overload relay will probably trip.

5.4. MOTOR FIELD LOST PROTECTION ADJUSTMENT (RMC RELAY):

The elevator controller monitors the motor field current continuously. As soon as the current becomes less than the adjusted level, the elevator will stop immediately.

? Place a meter between the terminals "MF1" and "MF2". The standing voltage should be measured.

? Make sure that the potentiometer is completely turned to the left (+). At this time, the red light should be slowly blinking (about every second). This indicates that the adjustment is on the verge of being triggered and that the relay is deactivated.

? Turn the potentiometer slightly to the right to obtain a margin of security.

5.5. OPERATION SPEEDS ADJUSTMENT:

The IPC D1025 card has 5 speeds. The contract speed is always represented by "HI" label and equal to 10 volts.

Speeds description:

? SP1: Levelling speed at floor landing (7 FPM)

? SP2: Floor approach speed (15 FPM)

? SP3: Inspection speed (50 FPM)

? SP4: 1 floor run speed for 300 and 350 FPM elevator.

? HI: Elevator contract speed

How to compute voltages for the required speeds ?

Example:

10 Volts = 350FPM (contract speed)
SP 1 = 7 FPM
*SP 1 = 7 * 10/350 = 0.2 volts*

Write SP1 reference voltage (VDC).

Write SP2 reference voltage (VDC).

Write SP3 reference voltage (VDC).

Write SP4 reference voltage (VDC).

Remove "NA" and "R" relays.

IPC D1025 1st generation card:

Place the negative meter lead on the "TP4/GND" standoff. Place the positive meter lead on the "REF IN" standoff.

IPC D1025 MKII:

Place the negative meter lead on the "TP5/COMMUN" standoff. Place the positive meter lead on the "REF IN" standoff.

Speed adjustment example:

Place a jumper between terminals "SP1" and "REF IN". Turn the "SP1" potentiometer until the meter shows the reference voltage that you have previously calculated (Ex. 0.2 volts).

Repeat that operation for all other speeds before passing to the next section

5.6. GENERATOR/MOTOR SYSTEM ROTATION TEST:

Apply the power to the elevator controller

5.6.1. Tachometer direction verification:

Place the positive meter lead on the terminal "+UP". Place the negative meter lead to the terminal "-UP".

Turn manually the tachometer in the direction of an elevator moving up.

It can be easier and faster to open manually the brake and verify the elevator movement.

"When the elevator goes up, the measured voltage should be positive".

IPC D1025 MKII card:

This model allows open loop operation. So, it will be easier to verify the tachometer polarity. Place the negative meter lead on the "TP5/COMMUN" standoff. Place the positive meter lead on the "TP2 TACH" standoff. Step to the next section for the rotation test.

5.6.2. "Armature feedback" and "contract speed" initial adjustment:

Note: the potentiometer as 20 turns.

Turn the "ARMATURE FBK" potentiometer 20 turns counterclockwise and after 10 turns clockwise to place the potentiometer in the middle. This one will be readjusted later.

Turn the "CONTRACT SPEED" potentiometer 20 turns counterclockwise and after 10 turns clockwise to place the potentiometer in the middle. This one will be readjusted later.

5.6.3. SCURVE/ACCEL/DECEL potentiometers initial adjustment:

Note: the potentiometer as 20 turns.

Turn ACCEL START, ACCEL END, DECEL, START, DECEL END, 20 turns counterclockwise and after 10 turns clockwise to place the potentiometers in the middle.

Turn ACC1, ACC2, DCC 1, DCC2, 20 turns counterclockwise and after 10 turns to place the potentiometers in the middle.

5.6.4. Generator rotation test:

Connect all required signals to be able to run the elevator in inspection mode. Place the controller switch at the "INSPECTION" position. Place the "STOP/RUN" switch at the "RUN" position.

IPC D1025 MKII:

Place the "J8" jumper at the 'SETUP" position to run the elevator in open loop.

Cavalier J8:

Place a jumper between "J7" and "J10" standoff. The tachometer supervision will be deactivated. The direction protection will be deactivated.

Cavalier J7:

Cavalier J10:

CAUTION

When you will try to move the elevator with "PCH" or "PCB", the AC motor will start.

If the generator field and the generator armature are not in the good polarities, a self excitation will occurred.

BE READY TO SHUTDOWN THE MAIN POWER IF THE ELEVATOR RUNS AWAY.

Measure the voltage across the generator armature. As soon as the generator starts, the voltage must drop to zero. If the voltage goes up, shut down immediately the power.

Activate the "PCH" or "PCB" signal in order to move the elevator in one direction.

Elevator runs away as soon as the generator start:

Remove the power and change the generator field polarities. Swap the "GF1" and "GF2" leads. Apply the power and try once again to move the elevator.

Elevator moves up on a down command and moves down on an up command:

Remove the power and change the motor field polarities. Swap the "MF1" and "MF2" leads. Apply the power and try once again to move the elevator.

Once the elevator can move in both directions, verify the tachometer voltage to get a positive voltage in UP direction and a negative voltage in down direction.

When the elevator is able to move in both directions pass to the next section.

5.6.5. CONTRACT SPEED potentiometer adjustment:

Remember your inspection speed "SP3" previously adjusted.

Example:

SP3 = 50 FPM

Measure the real elevator speed with a hand tachometer. Move the elevator in down direction and turn the "CONTRACT SPEED" potentiometer until the speed become 50 FPM. Be sure that the elevator moves for a while to reach the requested speed.

That potentiometer will be readjusted later for a precise contract speed.

5.6.6. "ARMATURE FEEDBACK" current potentiometer adjustment:

IPC D1025 card 1st generation:

Place the negative meter lead on the "TP4/GND" standoff. Place the positive meter lead on the "TP3 ARM" standoff.

IPC D1025 MKII card:

Place the negative meter lead on the "TP5/COMMUN" standoff. Place the positive meter lead on the "TP3 ARM FBK" standoff.

You will need to measured between 7.0 and 8.0 volts when the elevator will move at contract speed in close loop operation.

For the moment, the armature feedback voltage will be adjusted according to inspection speed operation.

Example:

SP3 = 50 FPM.
Contract speed = 200 FPM
Then, 7.5 volts = 200 FPM
X volts = 50 FPM

During inspection operation = 7.5 X 50/200 = 1.875 volts

Move the elevator in down direction:

- The measured voltage must be negative. If the voltage is positive, stop and reverse the 2 wires on the IPC card terminals "ARM +" and "ARM –".

- While moving, turn the "ARMATURE FEEDBACK" potentiometer until you measure around 1.875 volts.

5.7. "CLOSE LOOP" OPERATION MODE:

IPC D1025 MKII card:

Place the "J8" jumper at the "AUTO" position for close loop operation.

Move the elevator in both directions in inspection mode. Use a tachometer and measure the real speed in both directions. The speed should be equal in both directions and correspond to the inspection speed potentiometer adjustment.

Real inspection speed verification:

Measure the elevator real speed with a hand tachometer. Move the elevator in both directions. Turn the "CONTRACT SPEED" potentiometer until the real speed becomes the same as the inspection speed potentiometer adjustment. Be sure that the elevator moves for a while to reach the requested speed.

The acceleration can be long. The accel 1 potentiometer is not adjusted.

OSCILLOSCOPE

If you have an oscilloscope, you can connect it like the following:

IPC D1025 card 1st generation:

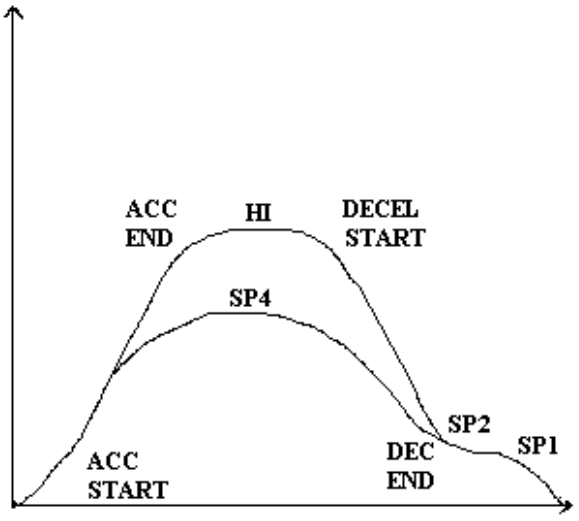
Place the channel "A" negative lead to the "TP4/GND" standoff. Place the channel "A" positive lead on the "TP1/REF OUT" standoff. Place the channel "B" positive lead on the "TP2/TACH" standoff.

IPC D1025 MKII card:

Place the channel "A" negative lead to the "TP5/COMMUN" standoff. Place the channel "A" positive lead on the "TP1/REF OUT" standoff. Place the channel "B" positive lead on the "TP2/TACH" standoff.

5.8. ACCELERATIONS/DECELERATIONS/SCURVE ADJUSTMENT:

The IPC card offers 4 potentiometers to round off each curve corners separately.



ACCEL START: Scurve factor at the beginning of the acceleration.

ACCEL END: Scurve factor at the end of the acceleration.

DECEL START: Scurve factor at the beginning of the deceleration.

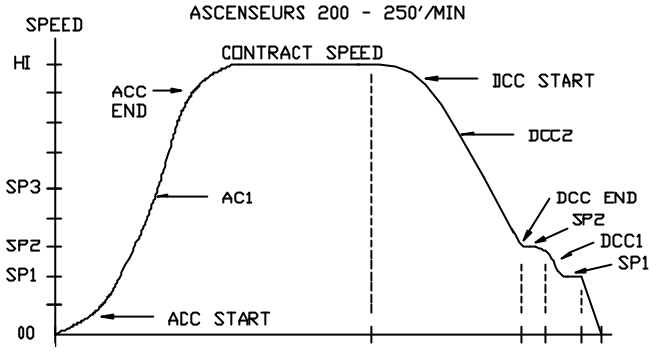
DECEL END: Scurve factor at the end of the deceleration.

Those 4 adjustments are applied for each of "accel/decal". They will affect all speeds.

Difficulty obtaining contract speed:

If the resistance is too high, the current flowing in the field will not be enough to obtain full speed. First step, short-circuit the "R3A" resistance with a jumper. Normally, the elevator should obtain the contract speed.

50-250 FPM elevator: Run 1 floor elevator (300-350 FPM):



For those rides "ACCEL 1" and "DECEL 1-2" will be used.

The slow down distance is adjusted via "DM0132" on perforated tape selector elevator.

For these rides, it is very important to get the speed potentiometer adjustment for a short time period.

If a constant speed can not be obtained for 2 to 3 feet, it will be very difficult to obtain a precise deceleration at the floor.

Be careful with the "ACCEL END" and "DECEL END" adjustments. If those scurve factors are to round, you will have some problems to adjust those ramps.

Turn the "ACC1" potentiometer to increase or decrease the acceleration time.

Turn the "DCC2" potentiometer to increase or decrease the deceleration time.

? Car start-up.

? Start of deceleration (SP2 and DCC2 engages).

? Start of leveller (opening of car in LU and LD).

? Start of the door zone (DZO) (SO1 and DCC1 engages).

? Stopping of car and start of dead zone while the mechanical brake slowly falls. (dead zone adjustable from 0 to 0.5 sec.).

Adjustment procedure:

? As soon as both ramps are adjusted, step inside the car and do some rides to feel the comfort during acceleration and deceleration. The final floor stop will be adjusted later.

? Turn the scurve potentiometers up to the required comfort. If the elevator can goes to 300 FPM and more, do not spend to much time for 1 floor run ride. You can comeback later after high speed rides are adjusted.

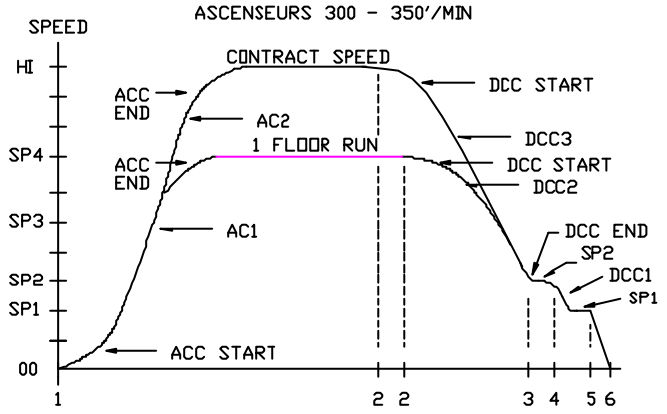
? When the comfort is mostly obtained, you can finish ramps adjustments to obtain A 2 inch distance at levelling speed before the floor stop.

Sometimes it is difficult to have a precise 2 inch levelling distance with potentiometers adjustment. With a perforated tape system, you can have or remove 1 or 2 holes in DM0132 to avoid moving the potentiometer cursor. By doing this mechanical slow down, switches will need to be readjusted.

Difficulty obtaining contract speed:

If the resistance is too high, the current flowing in the field will not be enough to obtain full speed. First step, short-circuit the "R3A" resistance with a jumper. Normally, the elevator should obtain the contract speed.

300-350 FPM elevator: 2 floors run elevator and more:



These rides will use the "ACCEL 1-2" and "DECEL 1-2-3" potentiometers.

The register "DM0133" corresponds to the slow down distance for the "contract speed" and to the DM0132 for the "1 floor run" speed when a perforated tape system is used.

For these rides, it is very important to always obtain the contract speed for some distance.

If the contract speed can not be stabilized for a 2 or 3 feet distance, it will never be possible to adjust correctly the accel/decel ramps.

Be careful with "ACCEL END" and "DECEL END" adjustments. If the round off is too long, you will have problems to adjust ramps.

Turn the "ACC1-2" potentiometer to extend or reduce the acceleration time.

Turn the "DCC1-2-3" potentiometer to extend or reduce the deceleration time.

? Start of car.

? Start of deceleration (SP2 and DCC2 (1st floor run) and DCC3 (contract speed) engages).

? Start of levelling (opening of car in LU and LD)

? Start of door zone (DZO) (SP1 and DCC1 engages).

? Stopping of car and start of dead zone while the mechanical brake slowly falls. (dead zone adjustable from 0 to 0.5 sec.).

Adjustment procedure:

? As soon as both ramps are adjusted, step inside the car and do some rides to feel the comfort during acceleration and deceleration. The final floor stop will be adjusted later.

? Turn the scurve potentiometers up to the required comfort.

? When the comfort is mostly obtained, you can finish ramps adjustments to obtain a 2 inch distance at leveling speed before the floor stop.

Sometimes it is difficult to have a precise 2 inch leveling distance with potentiometers adjustment. With a perforated tape system, you can have or remove 1 or 2 holes in DM0133 to avoid moving the potentiometer cursor. By doing this mechanical slow down, switches will need to be readjusted.

5.9. GENERATOR/MOTOR FINAL ADJUSTMENTS

Final adjustments should be done when the elevator is full load.

5.9.1. R3A resistors adjustment:

The "R3A" resistor acts as a generator field current limit. On a shorted output bridge from the IPC card, the current can increase excessively and damage the generator field.

Problems to get the contract speed!

I the resistor is too high, the field current will not be sufficient to reach contract speed. 1st step, use a jumper and short-circuit "R3A" resistor. Normally, the elevator should get the contract speed.

2nd step, move the "R3A" resistor cursor to reduce the resistance and be sure that the contract speed is always obtained everywhere. Keep a safety margin to always get the contract speed.

5.9.2. "CONTRACT SPEED" verification:

Place the elevator to the top of the building and place a call to the bottom floor. With a hand tachometer, measure the real car speed. Turn the "CONTRACT SPEED" potentiometer until you get the desired contract speed.

5.9.3. "ARMATURE FEEDBACK" signal verification:

IPC D1025 card 1st generation:

Place the negative meter lead on the "TP4/GND" standoff. Place the positive meter lead on the "TP3 ARM" standoff.

IPC D1025 MKII card:

Place the negative meter lead on the "TP5/COMMUN" standoff. Place the positive meter lead on the "TP3 ARM FBK" standoff.

You should measure 8.0 volts maximum when the elevator runs at contract speed and full load.

Turn the "ARMATURE FEEDBACK" potentiometer until you get 8.0 volts on your meter full load.

5.9.4. IPC card time response adjustment:

IPC D1025 card 1st generation:

This card has only "STABILITY GAIN" adjustment.

IPC D1025 MKII card:

This card has 2 gains for speed error correction:

"STABILITY GAIN" + "LOOP GAIN":

Generally, the IPC card response is very good when these potentiometers are at the middle of the adjustment for all geared elevators.

If you feel some bumps in the elevator and the (OUT OF REGULATION) led flashes on the IPC card; two things can cause that. A too high motor field current or the "armature feedback" is too far from the 7.5 volts at contract speed.

If overshoot or undershoot are observed at accel/decel end, these adjustments will help to remove them.

"LOOP GAIN" adjustment:

This gain changes the speed of the speed error correction between the real car speed and the speed command.

? Low Gain: The leveling distance will never be the same in both direction and load condition. The card is too slow to correct the error. Turn the potentiometer clockwise to increase the gain.

? High Gain: Fast ripple will be felt at speed transition end. Turn the potentiometer counter clockwise to reduce the gain.

"STABILITY GAIN" adjustment:

The stability gain is applied to the "ARMATURE FEEDBACK" signal. To modify this adjustment, you need to measure that signal.

IPC D1025 card 1st generation:

Place the negative meter lead on the "TP4/GND" standoff. Place the positive meter lead on the "TP3 ARM" standoff.

IPC D1025 MKII card:

Place the negative meter lead on the "TP5/COMMUN" standoff. Place the positive meter lead on the "TP3 ARM FBK" standoff.

If the voltage displayed on your meter oscillates a lot, turn the "stability gain" potentiometer either way. That adjustment should get ride of these ripples.

Remember, you should measure between 7.5 and 8.0 volts when the elevator runs at contract speed. If it is not the case, modify the "ARMATURE FEEDBACK" adjustment.

5.9.5. Elevator adjustment just after brake opening:

Each time the elevator leaves a floor, the IPC card is activated, but the speed command is ZERO. The brake opens and then the elevator accelerates. The zero speed delay is adjustable and allows the brake pads to release before moving.

DM0340: Zero speed delay on start (in tenth of second).

5.9.6. Floor stops adjustment:

Each time the elevator stops at a floor, the "STOP DELAY" ramp is applied.

When the elevator level to the floor at 7 FPM:

"LU" or "LD" sensor activates the leveling portion and as soon as the leveling sensor turns OFF, the final deceleration ramp is applied.

Adjust the "STOP DELAY" potentiometer for the floor stop precision.

Generator suicide circuit:

The generator suicide circuit must me applied as soon as the deceleration ramp is finished. If not, the elevator will start to move with the brake applied.

DM0048: Delay before the suicide circuit will be applied (in a tenth of second). (Tim48)

This delay can vary between 0.0 and 1.0 second.

Example:

DM0048 = 0005 (0.5 second)

5.9.7. Tachometer lost detection and opposite direction detection:

Carte IPC D1025 1st generation:

You must always verify that the "J5" standoff is jumped at the "E" position "ENABLE". Then, the IPC card verifies the tachometer feedback.

Carte IPC D1025 MKII:

Pull out the jumper on "J7" standoff. Then, the IPC card verifies the tachometer feedback.

Pull out the jumper on "J10". Then, the IPC card detects under speed and opposite direction movement. The selected speed and polarity are the base point.

CAUTION: During that test, the elevator will run away. Be sure that the main power can be shut down at any time if the IPC card will not trip on a tach lost.

Test procedure:

? Place the elevator in the middle of the hoistway.

? Move the elevator in one direction in inspection.

? Unplug the tachometer green connector while the elevator is moving.

Run away situation with IPC card lost detection:

You can reset manually the IPC card or the controller will reset 3 to 4 times automatically.

5.9.8. 125% governor test:

The speed command can never go higher than +/-10 volts according to the direction. There is only one way to increase the car speed up to 125% of the contract speed.

Procedure:

? Place the elevator to the top floor.

? Visually observe the position of the "CONTRACT SPEED" potentiometer and remember how many turns you will rotate that potentiometer. Turn that potentiometer 2 to 3 turns clockwise.

? Place a call 2 floors minimum under the actual position.

? Use a hand tachometer and measure the real car speed.

OBSERVATION:

If the measured speed is under the contract speed, the potentiometer was turned in the wrong direction. Bring back the elevator to the top and turn the potentiometer in the opposite direction.

If the measured speed was higher than the contract speed but not enough to trip the governor, turn more in the same direction and place another call in down direction.

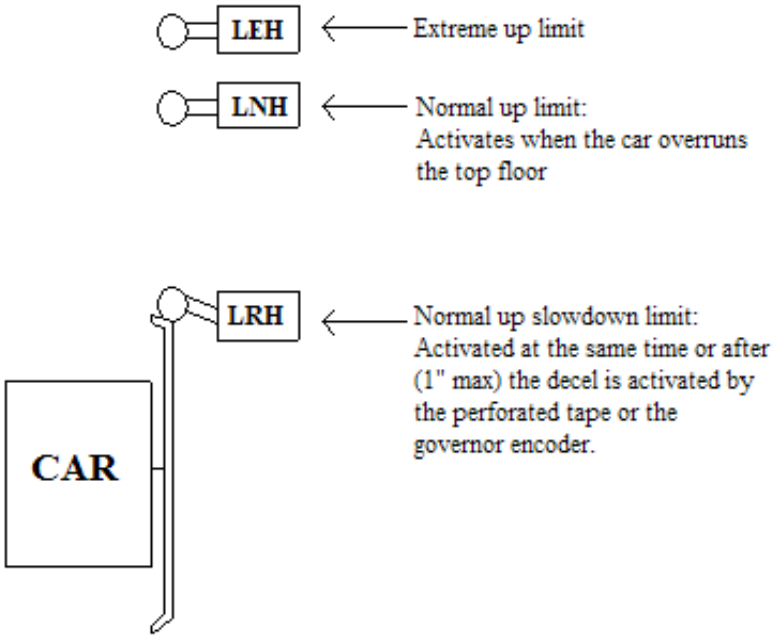
? Once finished, turn back the "CONTRACT SPEED" potentiometer at the initial position and fine tune the contract speed with a hand tachometer.

6. SLOWDOWN NORMAL LIMITS ADJUSTMENT AND EMERGENCY TERMINAL STOPPING DEVICE SYSTEM FOR OVER THAN 200 FPM ELEVATORS:

6.1. END OF TRAVEL LIMIT SWITCHES INSTALLATION WITH STANDARD TAPE:

Speed limiting device.

200 FPM and less:



The same corresponding limit switches are found at the bottom floor: LRB, LNB and LEB. Down normal slowdown limit switch must be activated at the same time or slightly after (max 1 in of travel) the magnet activates the "DSL" sensor. The down normal limit switch must be activated as soon as the car goes slightly lower than the bottom floor.

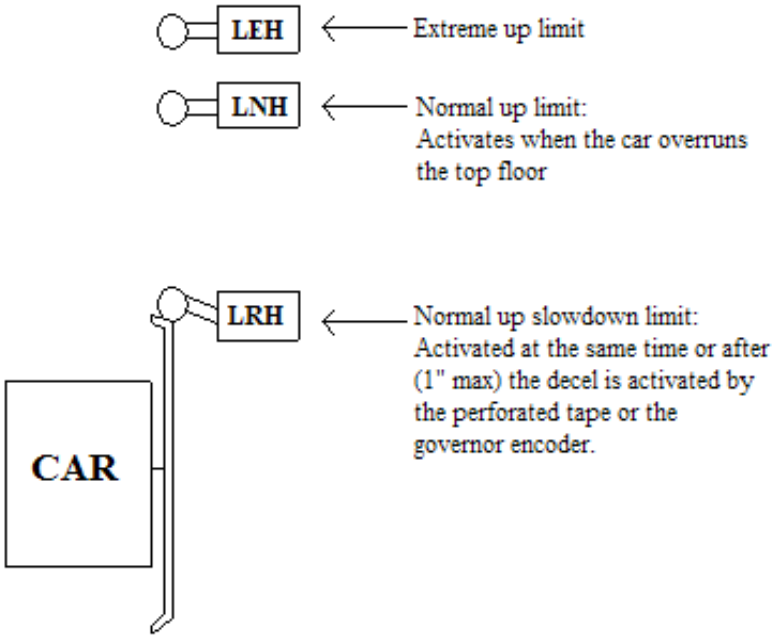
Make sure the deceleration is engaged by the magnets, not by the limit switches (LRH-LRB).

Make sure that normal stops at top and bottom floors are engaged by the magnets, not by the limit switches (LNH-LNB).

6.2. SLOWDOWN LIMITS ADJUSTMENT WITH PERFORATED TAPE OR GOVERNOR ENCODER:

There are two ways to adjust the slowdown limits. The first one is by measuring and the second one is by watching the "DM490" register. The actual elevator position is shown in that register.

On a 250 FPM or less elevator, the slowdown limits are LRH and LRB:



If the Schmersal magnetic switch are provided by Automatisation JRT, refer to section 6.4 for the installation.

1st way:

? If the number of holes entered in the DM132 for slowdown is 82, the slowdown distance is: 82 x 0.75 in = 61½ in

Therefore, the limits should engage slightly closer to the final terminal landing that is, approximately 61 inches before arrival.

2nd way:

? LRH adjustment: Place the car to the top terminal landing equal to the floor (DZO activated, LU and LD deactivated). Note the quantity of holes in the DM490 (ex. 500 holes). Take the value and sub the DM132's value (ex: 82 holes) Add one hole to the result and this one will give the position of the slowdown limit LRH.

Example:

To see the "DM490" value: connect the programming console in "MONITOR MODE" and press or use the LCD (See appendice C):

CLR	MONTR	CLR	DM	490	MONTR

500 holes (position of the top terminal landing in the DM490)
82 holes = DM132

500-82 = 418 holes
418 + 1 hole = 419 holes, position of the slowdown limit "LRH"

? LRB adjustment: Place the car to the bottom terminal-landing equal to the floor (DZO activated, LU, and LD deactivated). Note the quantity of holes in the DM490 (ex. 10 holes). To this value, we must add the DM132 and after, sub 1 and this result will give the position of the slowdown limits LRB.

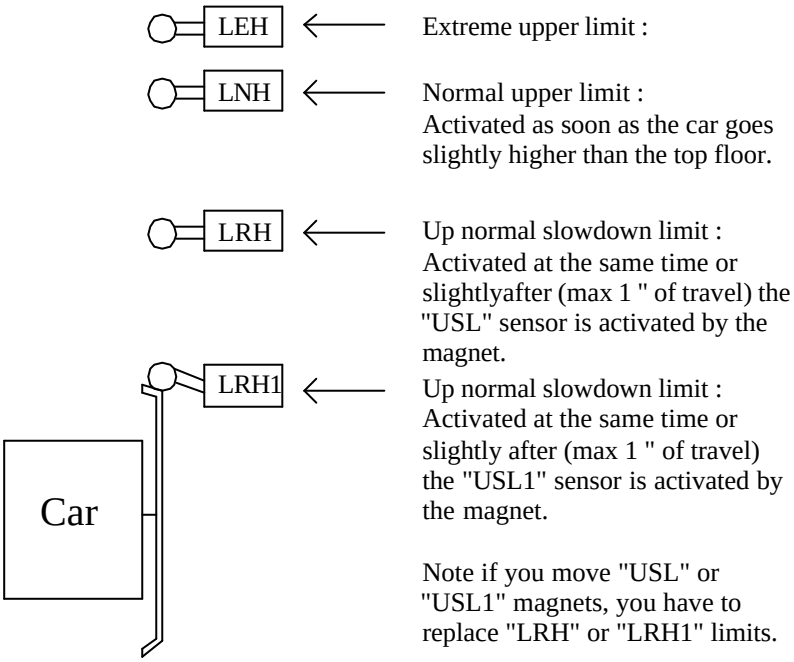
Example:

To see the DM490: connect the programming console in "MONITOR MODE" and press:

CLR	MONTR	CLR	DM	490	MONTR

10 holes or pulse (position of the bottom terminal landing up in the DM490)
82 holes or pulses = DM132
10+82 = 92 holes or pulses
92 - 1 hole = 91 holes or pulses, position of the slowdown limit LRB

Elevator 300-350 FPM and more, the slowdown limits are:


LEH
Extreme upper limit :
LNH
Normal upper limit :
Activated as soon as the car goes slightly higher than the top floor.
LRH
Up normal slowdown limit :
Activated at the same time or slightlyafter (max 1 " of travel) the "USL" sensor is activated by the magnet.
LRH1
Up normal slowdown limit :
Activated at the same time or slightly after (max 1 " of travel) the "USL1" sensor is activated by the magnet.
Car
Note if you move "USL" or "USL1" magnets, you have to replace "LRH" or "LRH1" limits.

? LRH1-LRB1 = First slowdown (high speed).

? LRH-LRB = Second slowdown (one floor run).

LRH1-LRB1 adjustment:

1st way:

? If the number of holes entered in the "DM133" for slowdown in high speed is 120, the slowdown distance is: 120 x 0.75 in = 90 in

Therefore, the limits "LRH1" and "LRB1" should engage slightly closer to the final terminal landing; that is, approximately 89 inche s before arrival.

2nd way:

? Follow the same procedure as 250 FPM and less elevators adjustment except that you must add or subtract the DM133's value instead of DM132's value.

? LRH1: 500 holes (position of the top terminal landing in the DM490) – 120 holes (DM133) + 1 hole = 381 holes position of the slowdown limit LRH1.

? LRB1: 10 holes (position of the bottom terminal landing in the DM490) + 120 holes (DM133) - 1 hole = 129 holes position of the slowdown limit LRB1.

LRH-LRB adjustment:

1st way:

? If the number of holes entered in the "DM132" for slowdown in one floor run is 75, the slowdown distance is: 75 x 0.75 in = 56 in.

Therefore, the limits "LRH" and "LRB" should engage slightly closer to the final terminal landing; that is, approximately 55 inches before arrival.

2nd way:

? Follow the same procedure as 250 FPM and less elevators.

? LRH: 500 holes (position of the top terminal landing in the DM490) – 75 holes (DM132) + 1 hole = 426 holes position of the slowdown limit LRH2.

? LRB: 10 holes (position of the bottom terminal landing in the DM490) + 75 holes (DM132) - 1 hole = 84 holes position of the slowdown limit LRB2.

Always make sure that slowdowns are initiated by the perforated tape rather than by the slowdown limits.

If the number of holes for slowdown is changed, the slow down limit switches must be moved.

6.3. CORRECTION OF SLOWDOWN LIMITS POSITION WITH PERFORATED TAPE OR GOVERNOR ENCODER:

When the elevator will have done a few runs to the extreme floors, 4 warnings of wrong limits adjustment can be displayed in the alarms.

Warning	Description	Corresponding DM
HR83.14	Wrong LRB adjustment	DM360
HR83.15	Wrong LRH adjustment	DM364
HR84.00	Wrong LRB1 adjustment	DM362
HR84.05	Wrong LRH1 adjustment	DM366

To correct the situation, visualise the DM corresponding to the fault. This value corresponds to the holes difference between the deceleration point and the limit's position. So, if the value of a DM=2, the elevator starts to slowdown and 3 holes further the elevator touches to the slowdown limit.

If the value is "0", the elevator touches the normal slowdown limit before or at the same time as the deceleration point. It should be lowered a little for the elevator to decelerate with the deceleration point and not with the normal slowdown limit. The elevator that touches the slowdown limit before the deceleration point will stay in levelling speed longer to this floor than to the others. A value between 1 and 3 should be in the DM corresponding for a good slowdown limit adjustment.

Example with LRB:

To visualize the DM360, use the C200H-PRO27 console, or CQM1-PR001-E or LCD (See appendice C) and do:

CLR	MONTR	CLR	DM	490	MONTR

10 holes or pulse (difference between the deceleration point and the limit)(12 in=16 holes (12/16=0,75))
*10 holes or pulses *0.75=7.5 in= DM132*
The normal slowdown limit LRB has to go 7 in up.

The number of holes difference should be between 1 and 3.

If the number of holes or pulses for the deceleration is changed, thenormal slowdown limits should be moved

6.4. CPM2C PLC

Elevators going faster than 200 FPM require emergency stopping devices at top and bottom floors. A second processor calculates the actual speed of the elevator using the perforated tape.

Put the controller in maintenance mode to adjust and leave the jumpers on the emergency stopping devices.

Processor particularities:

? This processor sends a signal each time the elevator speed exceeds 150 FPM, which allows to detect an uncontrolled speed in inspection mode and in levelling.

? This processor will detect and will stop the elevator if its speed exceeds 115% of the contract speed.

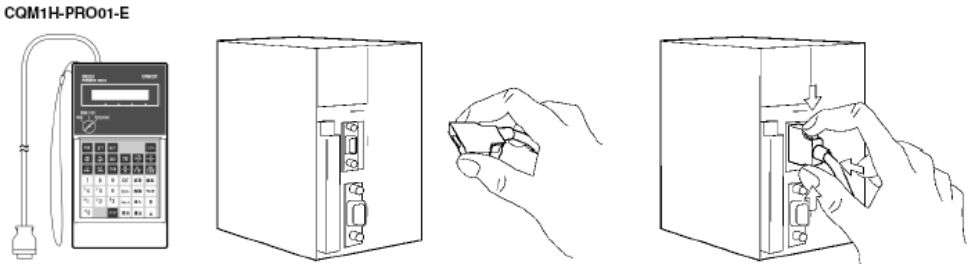
? This processor has an automatic speed capture mode that stores the speed measured when the emergency stopping devices are reaches at top and bottom floors.

? In normal operation, when the actual speed of the elevator exceeds the speed captured during the floor learning process, an emergency stop will be triggered.

Adjusting the ratio between the motor RPM and the actual FPM:

Put the elevator in "MAINTENANCE" mode using the switch inside the controller and leave the jumpers on terminals SLB1, SLB, SLH1 and SLH. When the accel/decel commands are well adjusted, place a car call and verify the contract speed using a tachometer.

Install the CQM1-PRO01 programming console on the black CPM2C PLC.



Internal registers to verify:

DM14: Contract speed in FPM (Adjusted during manufacturing according to the project).

The DM14 register should be modified according to the contract speed.

Example:

Press:

CLR	DM	0014	MONTR
Screen =	DM0014	350 Contract speed in FPM	
CHG	350	WRITE	

When the motor speed (fpm) at contract speed is written in the DM14, place a car call far enough to reach maximum speed. The DM60 register will show the elevator speed in FPM.

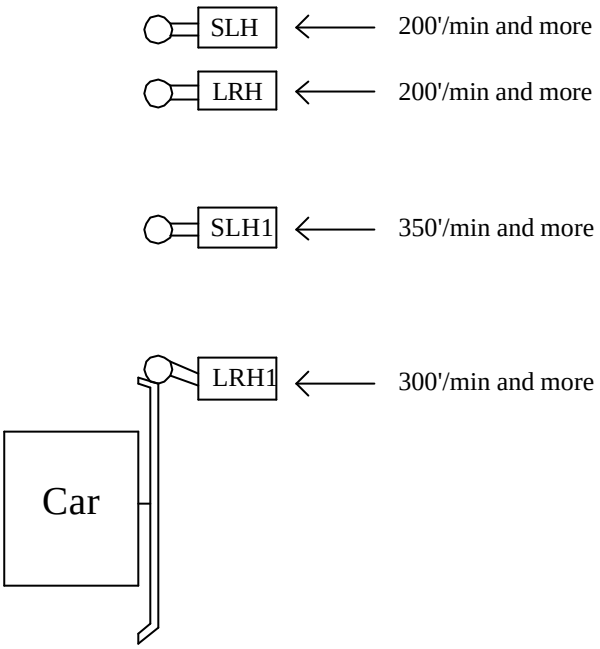
Press:

CLR	DM	0060	MONTR

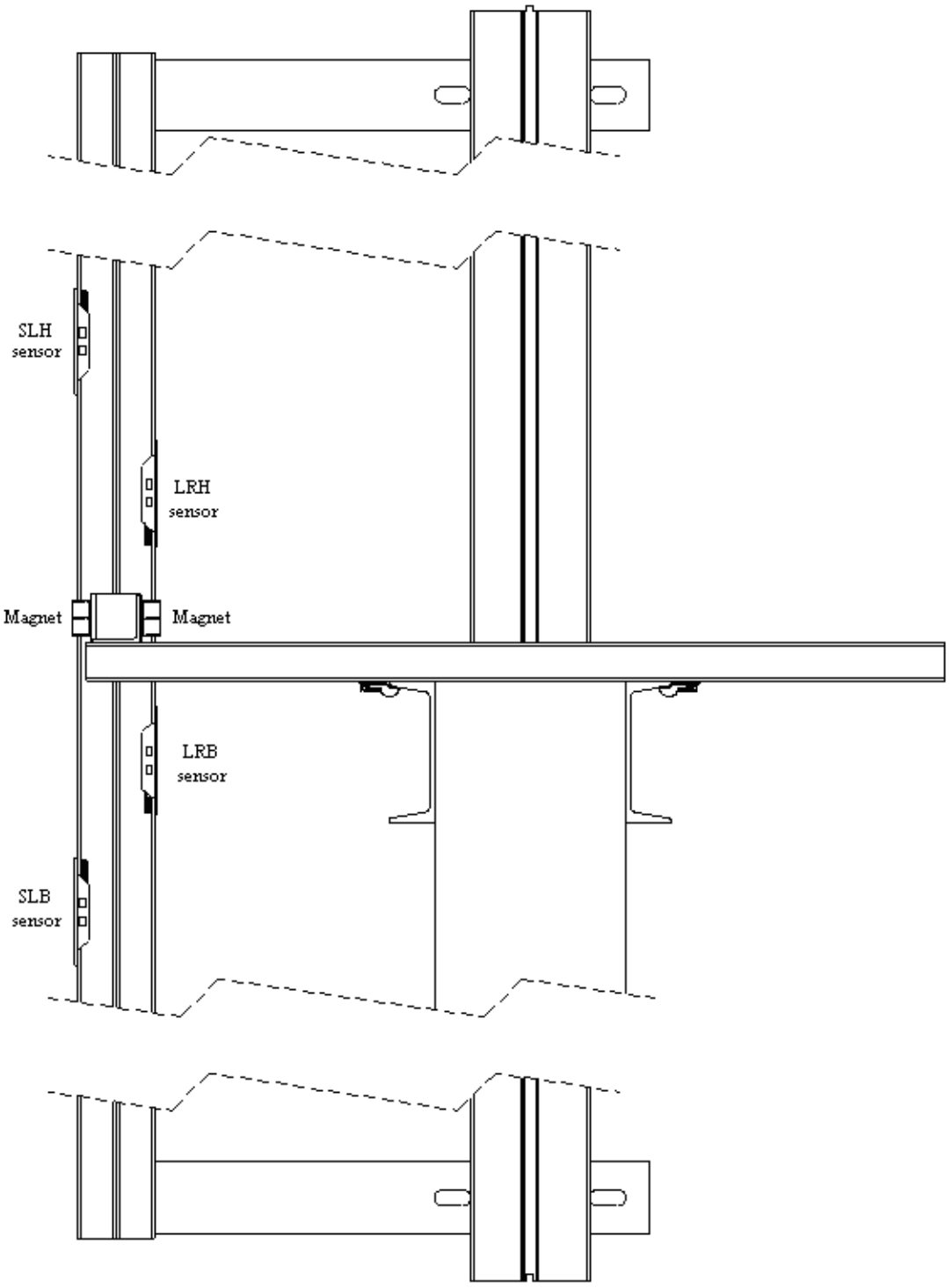
Screen = DM0060 Current speed in FPM

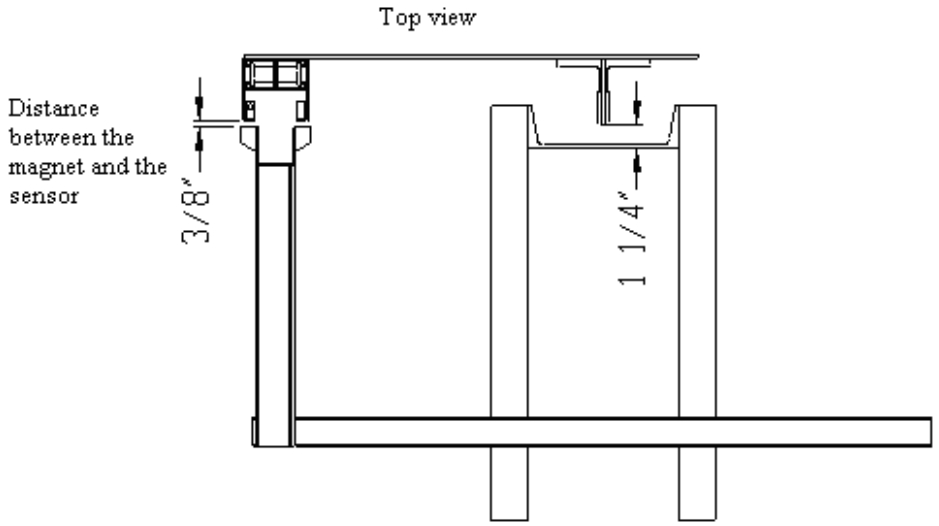
Steps to capture speeds at the top and bottom of the hoistway:

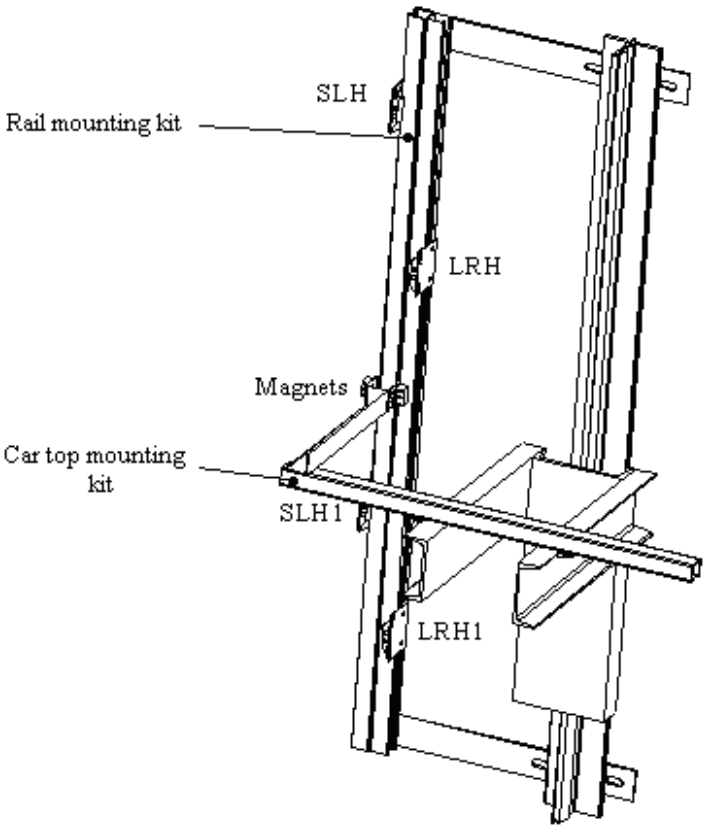
? Installing the mechanical switches:



? Installing the magnetic switches provided by Automatisation JRT inc.:







SLH: Emergency stopping device top floor (2nd floor at 300 FPM and +)

LRH: Normal slowdown limit top floor (low speed travel at 300 FPM and +).

SLH1: Emergency stopping device top floor 1st level.

LRH1: Normal slowdown limit top floor high speed travel.

? Install switches SLH1, SLH, SLB1 and SLB according to the following table (switch LRH1, LRH, LRB1 and LRB):

Necessary limits relative to the contractual speed:

Speed	200 FPM	250 FPM	300 FPM	350 FPM	400 FPM
SLH1	-	-	-	X	X
SLH	X	X	X	X	X
SLB1	-	-	-	X	X
SLB	X	X	X	X	X

? Position the SLB and SLH limits at about 24 in from the normal slowdown limit (LRB and LRH.) To do so, install the SLB limit 24 in below the LRB and SLH to 24 in above LRH.

? Position the SLB1 and SLH1 limits at about 30 in from the normal slowdown limits (LRB1 and LRH1.) To do so, install the SLB1 limit at 30 in below LRB1 and SLH1 at 30 in above LRH1.

? Schmersal magnetic switches provided by JRT have an unknown state during installation. Place a car call at the top and bottom floor and observe the PLC inputs. When the car is in the middle of the hoistway, the PLC inputs SLB1, SLB, SLH1 and SLH must be activated. If there are mechanical switches for SLB1, SLB, SLH1 and SLH, go to the following step.

? Remove the jumpers from the terminals SLB1, SLB, SLH1 and SLH. Keep the controller in "Maintenance" mode.

? Make sure there is a value other than 0 in the DM230, DM232, DM234 and DM236. If not, put 10 in these registers.

? Using the programming console, write the following values to activate the speed capture mode.

? Type:

CLR	DM	0200	MONTR
CHG	1234	WRITE	

? DM202: The processor adds a speed error percentage in FPM for each SLB and SLH maximal limit value captured. The DM201 register contains a value between 30 and 90FPM (adjusted during manufacturing at 40FPM).

? DM203: The processor adds a speed error percentage in FPM for each SLB1 and SLH1 maximal limit value captured. The DM203 register contains a value between 30 and 90FPM (adjusted during manufacturing at 50+FPM).

The processor is now in speed capture mode. The processor will save the maximum speeds when the switches SLB1, SLB, SLH1 and SLH are reached.

The speed capture mode will end when two calls will have been answered at top and bottom floors in maintenance mode.

As soon as the speed capture mode is over, the processor will save the maximum speeds allowed with the error percentage contained in the register (DM202 for SLB and SLH and DM203 for SLB1 and SLH1).

Maximum speeds allowed:

Speeds captured in FPM	**Maximum speeds allowed FPM**
DM210: SLB reached	DM230: Maximum speed allowed on SLB
DM212: SLB1 reached	DM232: Maximum speed allowed on SLB1
DM214: SLH reached	DM234: Maximum speed allowed on SLH
DM216: SLH1 reached	DM236: Maximum speed allowed on SLH1

In normal mode, if the car actual speed exceeds one of the maximum speeds allowed, the elevator will stop automatically.

Maximum speeds allowed "SLB" and "SLH" should be below the one floor run speed. If the speeds calculated are higher, bring the two limits closer to the extreme floors and carry out the speed capture again.

If the captured values for SLH1 and SLB1 are almost even to the contractual speed, bring the 2 limits closer to the extreme floors and carry out the speed capture again.

Alarms:

The processor memorizes which alarms stopped the elevator. See section 13.1.2 for the alarms list.

Redo the speed capture procedur if the normal slowdown limits are moved or if the number of holes or decel pulses on the perforated tape or encoder is changed.

Test procedure for the emergency stop limits:

? Put the elevator in maintenance mode using the switch in the controller.

? Install a jumper on the top or bottom slowdown limit, depending on the test.

? Disconnect the wire HT1 or HT2 from the hoistway directly on the CQM1 PLC.

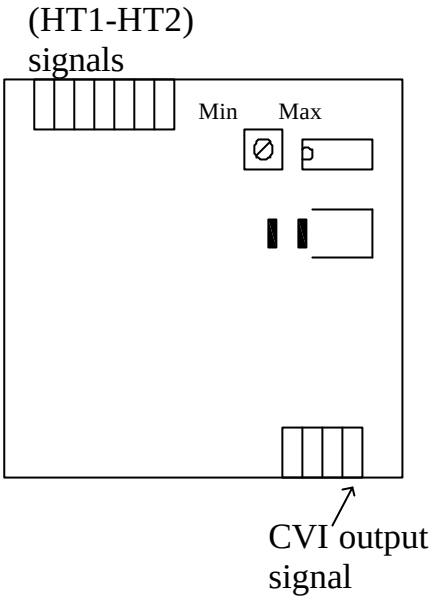
? Put the DM94 = 1 in the CQM1 PLC.

? Place a car call at the top or bottom floor according to the test.

Beware; the car will reach the limits at full speed, because the controller has no positioning devices in function.

? Afterwards, put back the car in normal mode turning the maintenance switch to normal. The DM94 will automatically equal 0 and the perforated tape will be operational. Remove the jumpers on the slowdown limits.

7. UNCONTROLLED SPEED DETECTION CIRCUIT ADJUSTMENT FOR 200 FPM ELEVATORS ONLY:



Cars running at 200 FPM :

These elevator controllers contain the PC board "JRT-OVS-HT1". That protection needs to be calibrated at 150 FPM for code requirement.

As soon as the elevator speed exceeds 150 FPM in inspection or levelling, the car will be stopped immediately and placed out of service.

The yellow led indicates power on the unit. When the red led is on, it indicates that the actual elevator speed exceeds the speed adjustment level.

Circuit adjustment:

? Change the inspection speed to 150 FPM.:

  ✍ Use the "SP3" potentiometer.

? Now, move the elevator to reach 150 FPM. When the elevator runs at 150 FPM. turn the potentio meter on the pc board (JRT-005-HT1) up you will see the red led flashing. The card adjustment is done.

? Put back the "SP3" to the previous value.

? In normal operation, the red led should turn on when the elevator accelerates and turn off when it decelerates. It should never be activated in inspection mode or when the elevator enters in the levelling zone.

8. ROPE GRIPPER SYSTEM:

The rope gripper is a protection device that will be dropped on the following conditions:

? The elevator moves out of the door zone (DZO) while landing door or car door is opened. (PP or PC relays disabled).

The rope gripper circuit has a 0.25 sec. off delay time constant to ignore doors bad contact while moving.

? Loss of power on "J4" security line in the controller. This could be caused by:

✍ Main power loss;

✍ Car safety engaged;

✍ Speed governor tripped;

✍ Final up limit "LEH" opened;

✍ Final down limit "LEB" opened;

✍ Pit switch opened

✍ Redundancy detection (R5 + ETSL).

In inspection mode, only the faults described above will drop the rope gripper. In "inspection" mode, the rope gripper will be maintained for 30 seconds when the maintenance person switches back the elevator to automatic mode. That allows enough time to leave the car top.

Rope gripper reset conditions:

? When the rope gripper dropped on a power loss.

As soon as the power comes back, the rope gripper is rearmed automatically if the doors and the safeties are in a closed condition

? The rope gripper dropped while moving out of the door zone and a door was opened

The rope gripper can be rearmed by pressing the GTS relay cursor located in the controller if doors are closed and all the safeties also.

The rope gripper can be rearmed if someone steps on the car top and puts the elevator in inspection mode.

If the elevator controller power is turned off and on, the controller will remember that the rope dropped on a door opened out of the door zone (DZO). The rope gripper won't be rearmed automatically. Only the two previous ways allow to rearm the rope gripper.

Temporary rope gripper automatic reset:

When the rope gripper hydraulic circuit has problems, the rope contacts can opens sometimes. A hall door lock can be also making intermittent trouble. The elevator controller can reset automatically the rope gripper if doors are closed and all the safeties are in a closed condition. This is a temporary solution. The elevator will still stop between floors at high speed.

Activate the automatic reset if using the elevator in automatic mode before the rope gripper is installed.

To activate the automatic rope gripper reset:

? Install the C200H-PRO27 console of the CQM1-PR001-E console, turn the key switch to "monitor" and type the password CLR-MONTR-CLR. You should see 00000 on the screen.

? Press:

DM	0074	**MONTR**
	Screen =	**D0074 0000**
CHG		**PRES. VAL? D0074 0000 ????**

? Write state 1 or 0

1	**PRES. VAL? D0074 0000 0001**
WRITE	**D0074 0001**

The rope gripper automatic reset is now activated. When the rope problem or the door lock is corrected, write a "0000" in the DM0074.

9. STANDARDISED OPERATION PARTICULARITIES:

A. There are three different cut-off timers on motorized door operators.

- Open door timer on hall call (TIM00, DM00)
- Open door timer on car call (TIM01, DM01)
- Open door timer on safety edge activation or photocell light beam interruption (TIM02, DM02)

If it so happens that there is a cut-off on hall call and car call simultaneously, the hall call timer would be the priority.

B. When you place the elevator in independent service, using the key switch inside the car, only the car calls are registered. However, if you wish to erase an unwanted car call, you have to turn off the key switch and then turn it back on.

C. There is a too long travel timer on the car displacement (TIM8, DM8) with a magnets tape selector, and TIM17, DM17 with a perforated tape selector.

D. If the car is held at one floor after 2 minutes without being in trouble, car calls and hall calls will be erased. That lapse of time is adjustable through DM20. In a two car or more group controller hall calls are switched to the other car.

E. The PLC monitors continuously the critical relays operations.

F. The elevator controller monitors drive operation like such:

- An electronic circuit, JRT-OVS-GL2, monitors the elevator's actual speed. When the elevator's speed exceeds 150-ft/ min. in inspection or levelling mode, the car stops immediately and is placed out of service (200 FPM elevators only).
- For elevators over than 200 FPM, another processor (CJ1M) monitors the real speed versus the contract speed. This processor also monitors the elevator deceleration versus the slowdown and emergency stopping devices.
- The drive must give a signal to the elevator controller as soon as the current flows through the motor.
- The drive must give a signal to the elevator controller to indicate that there is no fault condition.

G. In "RUN" position, the elevator can move in automatic mode. In "STOP" position, the elevator is placed out of order.

H. When this switch is set to "inspection", the car is placed in inspection mode and it is controlled from the control panel.

I. Some controllers are provided with a pre-maintenance switch. When this switch is set to "pre-maintenance", you may get the car ready to be placed safely in "maintenance" mode or "inspection" mode. New hall calls are cancelled but car calls are still registered.

In a two-car or more group controller, hall calls are switched to another car.

J. When the maintenance switch is set to "maintenance", it gives you the ability to control the car from the control panel. The doors will stay closed at each floor. However, car calls can still be registered, "door open" and "door close" push buttons are still enabled

K. This controller has a landing door bypass switch. When this switch is set to "bypass", the car is automatically placed in "inspection" mode and it can travel with the landing door opened but not the car door opened; you don't have to place any jumper at all to "bypass" the landing door contacts. Please note that the car will only move in car top inspection in this mode.

L. This controller has a car door bypass switch. When this switch is set to "bypass", the car is automatically placed in "inspection" mode and it can travel with the car door opened but not the landing door opened; you don't have to place any jumper at all to "bypass" the car door contacts. Please note that the car will only move in car top inspection in this mode.

M. The controller will detect any jumper that might be placed to bypass landing door or car door contacts.

Jumper on car doors: As soon as the car reaches a landing and opens its doors, it detects the jumper, automatically switches to "out of order" and remains at that landing with its doors open.

Jumper on landing doors: works just like the jumper on car doors.

N. There are many redundancy circuits in the controller. The CPU monitors those circuits continuously and as soon as a trouble is detected, the relays R5 and ETSL (for elevators running over than 200 FPM) will drop and the car is placed "out of order".

O. The door zone switch is monitored continuously. If it remains activated between two floors, the car is placed "out of order" as soon as it reaches a floor.

P. Leveling switches are also monitored continuously.

Q. If a fault condition occurs in the drive, the PLC will attempt to rearm it three times if necessary. If the fault persists, the rearming attempts will stop.

R. Message indicator can help you detect a few alarms (see section 13.1.1)

S. The elevator supplier can program several functions (see chapter 11).

T. Many alarms are registered by the PLC (see chapter 13).

10. TIMERS AND COUNTERS LISTING:

Timers are referred to as TIM and counters as CNT. Timer and counter settings that are user settable are stored in the data memory referred to as DM. DM register followed by a (*) can be modified simultaneously in every controllers from the monitoring system in the machine room.

10.1. DOOR CONTROL:

Open doors timer:

DM0000*: Open door delay on hall call. Timing begins when the door is fully opened.

DM0001*: Open door delay on car call. Timing begins when the door is fully opened.

DM0002*: Open door delay on a re-opening caused by safety edge activation or light beam interruption. Timing begins when the door is fully opened.

DM0173*: Open door delay if load weighing device 25% (LW3) is not activated. Timing begins when the door is fully opened. Enabled only if DM92 = 1.

Door protection:

DM0032*: Door closure delay beyond which the door will re-open (factory set to 5 sec.) if they are not completely closed (PC or PP enabled and DCL disabled). Enabled only if DM87 = 1.

DM0033*: Protection on door closure. Number of times (counter) the door will try to close without succeeding completely. Once the door closure delay (DM0032) will have been exceeded. Enabled only if DM87 =1. (DM33 factory set to 5).

DM0034: Door opening delay beyond which the door will re-close; for instance, if the door did not reach full opening or if the DOL limit switch has not been activated. That timer does not need to be set since the DM0000 overrides it automatically.

Nudging closure (enabled if DM84 =1):

DM0066*: Light beam interruption delay beyond which the door will be forced to close slowly. (Factory set to 15 sec.)

DM0067*: Delay before door re-opening, on a forced closure, if the door cannot close completely. (Factory set to 25 sec.)

DM0068*: Delay between two trials of door closure at slow speed. (Factory set to 5 sec.)

Preopening (enabled only if DM80 =1)

DM0088*: Door pre-opening delay once the car has entered the door zone. You may have to delay the door pre-opening to make sure that the doors are not opened more than 3/4 of the full width when the car reaches complete stop.

10.2. PASSING GONG (ENABLED IF DM81 =1):

DM0040: Pulse duration.

DM0043: Delay between two pulses when the car is going down.

10.3. OTHER TIMERS:

DM0008*: Too long travel delay with standard tape selector.

DM0017*: Maximum delay allowed to the car to reach the next floor at low speed immediately after the processor (PLC) detects no other counts from perforated tape or encoders.

DM0020*: Delay beyond which car calls and hall calls are erased if the car has not moved on its own calls. (Factory set to 180 sec.)

DM0024*: Delay before the car returns to the parking floor (enabled only if DM95 = 1 or if activated by STA external input, for simplex controllers. For duplex controllers, enabled only if DM1003 and 1004 are programmed) (Valid in group mode if the dispatcher sends a return request to the parking controller, the DM0095, 1003 and 1004 are non-applicable)

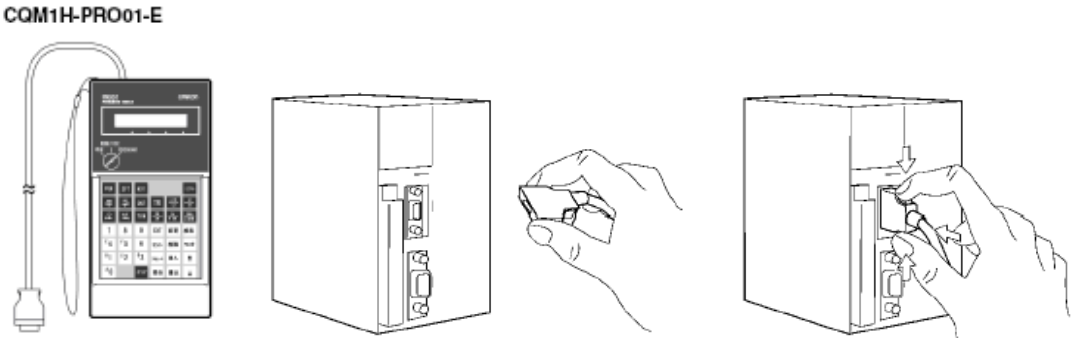
DM0038: Car call acknowledge pulse duration (enabled only if DM86 = 1).

DM0049: The time allowed for the drive to confirm current flow in the motor. A fault condition will be generated if no confirmation is received.

DM00169: Time before the lantern at the "next car up" landing turns off, if it has been on longer than the programmed time in the DM (minutes). (Enabled only in group mode).

For two cars (duplex) or more group controllers =the timers must be set in all controllers.

To set the timers, plug the C200H-PRO27 or CQM1-PRO01-E programming console into the CPU module peripheral port.



Turn the key switch to "MONITOR". The console will ask the password to allow communication with the CPU. The password is CLR-MONTR-CLR. You should read "00000" on the screen.

? Type in:

DM	Timer number Example: 0002	MONTR
	Screen = 3 sec.	D0002 0030

? Beware, delays are expressed in tenths of seconds. If you wish to set the timer at 5 sec., you must write 50.

CHG	PRES. VAL? D0002 0030 ????

? Enter the new delay (5-sec.).

5	0	PRES. VAL? D0002 0030 0050

WRITE	D0002 0050

The new delay is stored.

? To monitor the timers during elevator operation:

TIM	Timer number Example: 002	MONTR
	Screen = Example	T002 0040

If the timer is running, you can see the time decrease. When the timer reaches 0, the screen displays:

Screen =	T002 0000

Meaning that the timer is over and its output is energized.

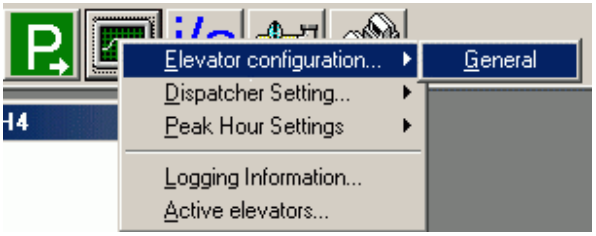
? You may monitor three timers simultaneously on the screen.

TIM	Timer number	MONTR
TIM	Timer number	MONTR
TIM	Timer number	MONTR
	Screen = Example	T005 T020 T015 0080 0120 0155

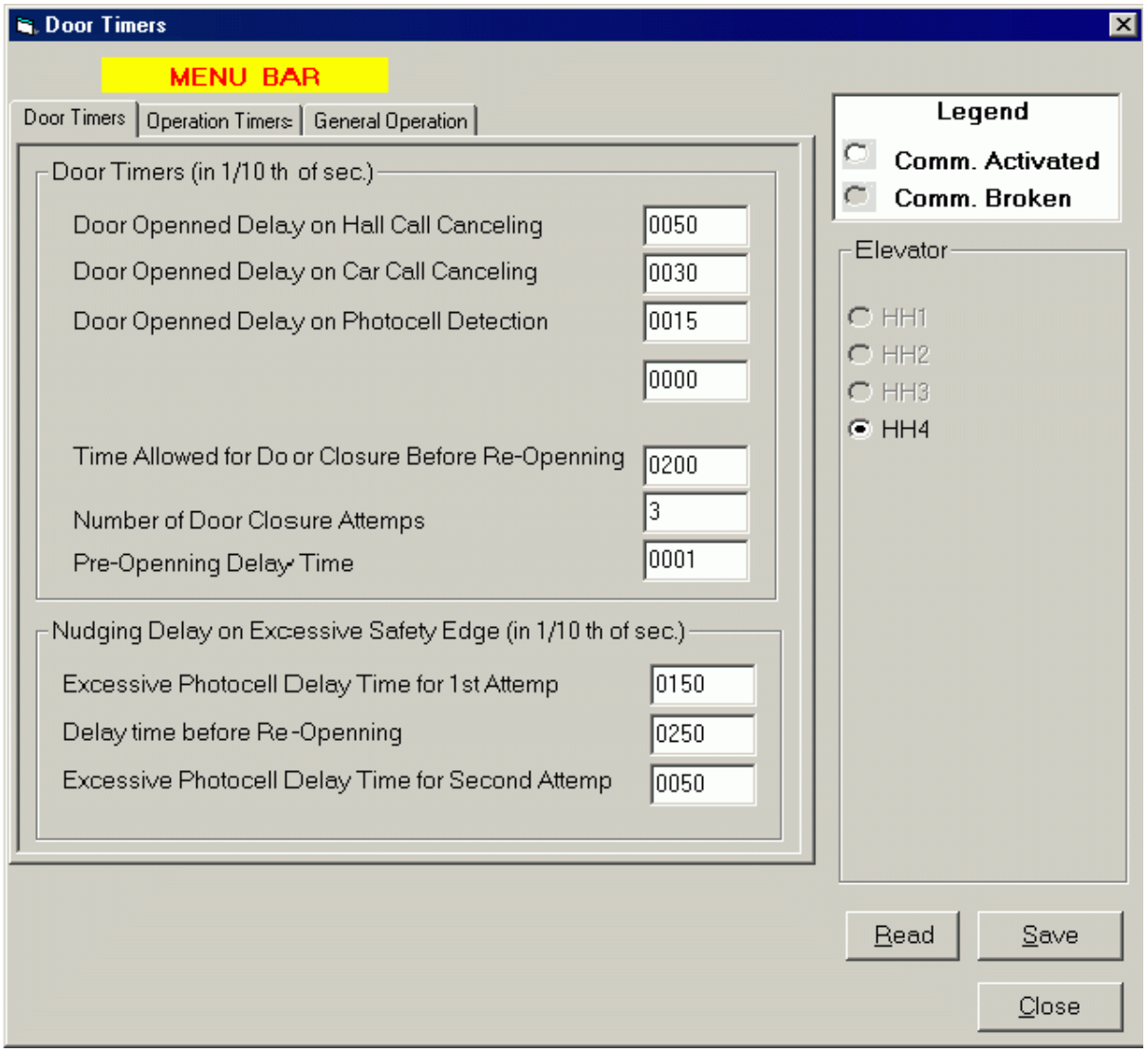
10.4. CHANGING TIME ON TIMERS, USING OPERATOR SCREEN:

It is possible, for each elevator, to see and change certain intern parameters of the PLC.

? Move the mouse cursor on the "sine wave" button and click on the left mouse button.



? Move the cursor on "elevator configuration" and wait a moment, until another menu appears on the right.



? Move the cursor on "General" and click on the left mouse button.

In certain custom projects, another word may appear instead of "General" (ex: motor, brakes). They are other sections of registers that can be modified with the operator screen. For these special menus, please refer to the owner's manual provided with the operator screen.

This window has a menu giving three possibilities to the user.

Selecting the parameters section to modify

Move the mouse cursor on the menu, on the text corresponding with the section required. A list of the modifiable parameters will appear.

Reading the actual content of a PLC

In the elevator section, there is a complete list of the network elevators. The white circles indicate the reading mode for this elevator is working. Grey circles indicate the elevator is not accessible for a distance reading (no communication).

Move the cursor on the white circle corresponding with the desired elevator and click the left mouse button. A black dot should appear.

Move the mouse cursor on the READ button and click the left mouse button.

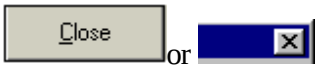
Modifying a parameter value

Move the cursor on the box containing the value to modify and click the left mouse button. Change the value using keypad keys BACKSPACE, DEL, and the arrows. Repeat the process for all parameters to modify.

Saving modified parameters

Only the parameters in the opened window will be saved in the PLC. So, save each section one by one. Move the cursor on the SAVE button and click the left mouse button. Once the transfer is complete, the message SUCCESS should appear at the top of the window. If not, save again.

To exit the window without modifying the parameters, move the mouse cursor on one of the buttons shown below and click the left mouse button.



or

11. PROGRAMMABLE FUNCTIONS DESCRIPTION:

The elevator supplier using the programming console C200H-PRO27 or CQM1-PR001-E may program many functions.

11.1. DOOR PREOPENING:

DM80 = 0: Disabled.

DM80 = 1: Pre-opening of the doors enabled once the car is in the door zone (DZO).

DM88: Time that delays the door pre-opening when entering the door zone. Adjust this time to have a ¾ door opening when the car reaches complete stop.

11.2. PASSING GONG:

DM81 = 0: disabled.

DM81 = 1: enabled.

DM85 = 0: One pulse, up or down travel. (see DM0040 for pulse length)

DM85 = 1: One pulse for up travel, two pulses for down travel. (See DM0040 and DM0043 to determine the impulse length and the laps of time between the two impulses)

11.3. EXCESSIVE CAR CALLS VERSUS PHOTOCELL:

DM82 = 0: Number of car calls unlimited.

DM82 = 1: Number of car calls limited to the value stored in DM83.

DM83: If the photocell is not activated, during opening and closing door sequence, a counter is increase and when his count exceeds the value stored in DM83, car calls will be cleaned. If the photocell is activated during opening door sequence, the counter is reset.

11.4. NUDGING:

DM84 = 0: disabled.

DM84 = 1: Enabled. The car door is forced to close if the photocell light beam has been interrupted for too long. The door closes at a slower speed while a buzzer sounds. The light beam interruption delay value is stored in DM66-67-68.

11.5. CAR CALL ACKNOWLEDGE BIP

DM86 = 0: disabled.

DM86 = 1: Enabled. The duration of the beep is stored in DM38.

11.6. DOOR CLOSING TROUBLE PROTECTION:

DM87 = 0: disabled.

DM87 = 1: Enabled. If the door has not succeeded to close before that delay is over, it will open automatically and then it will re-close. The door will make as many trials as the value stored in DM33 (factory set to 5 timers); if it is still unsuccessful, the door will then stay open, the car will be set to trouble and will take no more calls.

11.7. CAR CALLS CANCELATION AT TOP AND BOTTOM FLOORS:

DM89 = 0: Calls not cancelled.

DM89 = 1: Each time the car reaches the top or the bottom floor, all the car calls are cancelled.

11.8. CAR CALLS NOT ALLOWED IN REVERSE DIRECTION:

DM90 = 0: Car calls allowed in all directions.

DM90 = 1: Car calls for reverse direction not allowed. For example: if the car has an up command stored in memory and it is located at the fourth floor, car calls for the bottom, second or third floor will not be taken. If the car has a down command stored in memory and it is located at the fourth floor, car calls for an upper floor will not be taken. If the car reaches a floor and has no directions stored in memory it will take any direction car calls.

11.9. HIGH SPEED CANCELLED ON EMERGENCY POWER (ON 300 FPM AND MORE ELEVATOR):

DM91 = 0: High speed allowed on emergency power.

DM91 = 1: High speed cancelled on emergency power. This option limits the current that can be regenerated by the drive to the AC network when supplied by an emergency generator. In that situation, if there are not enough loads on the network to sink that current, the drive will trip. In addition, if the generator has not enough power to supply the controller in high speed this option could be used to limit the current.

11.10. HIGHER DOOR OPENING DELAY AT MAIN LANDING VERSUS LW3 WEIGHT LIMIT (25%):

DM92 = 0: Standard open door delay.

DM92 = 1: Higher door opening delay at main landing initiated. This option allows to increase the door opening delay at the main landing only if the LW3 (25%) weight limit is disabled. If it is enabled, the door opening delay stays unchanged. This option is used with a dispatcher to ensure the car will not rush its departure if empty. The door opening time value is accessible in the DM173.

The "close doors" button is not operational at the main landing if the LW3 weight limit has not been reached.

11.11. BUFFER TEST WITH PERFORATED TAPE OR ENCODER:

To make the buffer test you must:

? Put the elevator in maintenance mode with the JRT controller switch.

? Bypass the slowdown emergency terminal stopping, normal limit and over travel up or down switches with jumpers.

? Disconnect the wire "HT1" or "HT2" from the terminal.

? Enter DM94 = 1.

? Place a car call to bottom or top according to the test.

Be aware that the car will move at high speed to the buffers, since the control does not read the perforated tape pulses.

? Once the test is completed, set the maintenance switch back to normal position, then the DM0094 will be set to 0 automatically and the perforated tape will be operational.

11.12. HOME PARKING FOR ONE-CAR GROUP CONTROLLERS (SIMPLEX):

DM95 = 0: The car does not park itself automatically, unless it is activated by the STA input (key).

DM95 = 1: The car goes automatically to the parking floor, if it has not been called for a certain laps of time, which duration is stored in DM24. This function is disabled if the car is switched out of the automatic mode. However, you may force the car to the parking floor at any time, regardless of the value in DM95, by using the keys which are in the car or on a remote console.

The selection of the landing floor level to park the car at is made in DM97.

DM96 = 0: When the car arrives at the parking floor after automatic parking or in response to an STA key, the doors remain closed.

DM96 = 1: The doors will open when the car arrives at the parking floor after automatic parking or in response to an STA key. The doors will remain open as long as there is no call to be served.

DM97: Automatic parking floor (simplex only).

To program a landing, put the desired landing in DM97. For example, if you wish to park the car at the second floor, enter 2 in DM97. If you enter 0, the PLC will automatically set the value to 1 by default. If you enter a higher number than the total number of floors in the building, the PLC will automatically put the top floor.

11.13. HOME PARKING FOR TWO-CAR GROUP CONTROLLERS DUPLEX:

When two PLCs are networked together through RS232 communication cable, the controller #1 works as the dispatcher. DM95, DM96 and 97 are not used in this case because it is not a simplex

controller anymore. Parking floors are programmed in controller #1 only, and are dispatched as followed

? Two priority levels can be programmed. The first car without any call will park itself at the first parking floor level (priority) programmed in DM1003. If the second car becomes also free of any call, it will be assigned to the second parking floor level programmed in DM1004.

How to program parking floors (duplex controllers):

The values to be stored in DM1003 and DM1004 are the numbers corresponding to the parking floor desired. (For example, 3 for the third levelling the building).

? No parking floor required the two cars be to be parked at random. DM1003 = 0000 DM1004 = 0000.

? One car only parks itself (for example at the second floor) and the other one is parked at random. DM1003 =2 DM1004 = 0000.

? The first available car parks itself at the second floor and the other available car parks itself at the fourth floor. DM1003 = 0002 DM1004 = 0004.

The controllers are set in factory with the second option, with the ground floor programmed as the first parking floor.

The delay before returning to the parking floor is stored in DM24 and must be programmed in both controllers.

Home parking with door opened:

In each controller, DM1009 allows you to program the floor levels where you want the car to park, open its door and keep it opened.

? To see and change those floors levels, type in:

DM	1	0	0	9	M ONTR	SHIFT	MONTR

Screen =

DM1009
0000000000000010

Bit 15 ✍ ✍Bit 00

The bit at the far right (Bit 00) corresponds to the bottom floor of the building.

The bit at the far left (Bit 15) corresponds to the 16th floor of a building.

? To change, type in:

CHG

Screen = **DM1009 CHG?**
0000000000000010

You may now change the state of the bit above the blinking underline using the following keys:

✍	Move to the left.
✍	Move to the right.
1	Put the bit to 1.
0	Put the bit to 0.

? To save the settings, press:

WRITE

Example:

The parking floors in a building are the 2nd floor (ground floor) and the 4th floor (cafeteria). The user wishes that the doors stay opened only at the second floor.

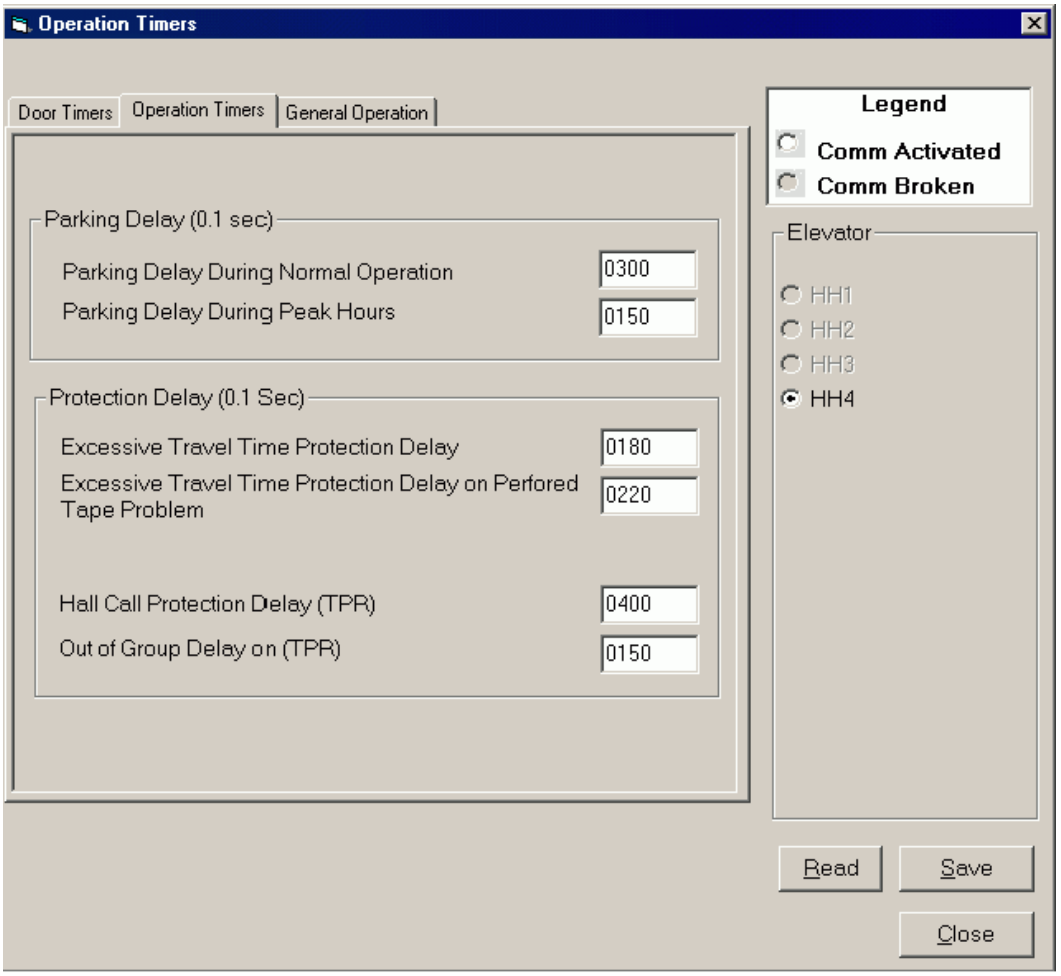
Therefore, the value to be stored is:

DM1009 CHG?
0000000000000010
DM1009 = (0002)

The setting of DM1009 must be done in both controllers. (Controllers #1 and #2).

11.14. HOME PARKING FOR GROUP CONTROLLER WITH OPERATOR SCREEN:

The car parks after the DM0024 time as soon as it receives authorization from the dispatcher. The delay is adjustable with the operator screen in the OPERATION TIMER section.



Level and parking doors state configuration with operator screen:

This option allows to specify to each elevator the state of the door when at parking level.

? Move the cursor over the menu option that shows the letter "P" and click on the left mouse button.

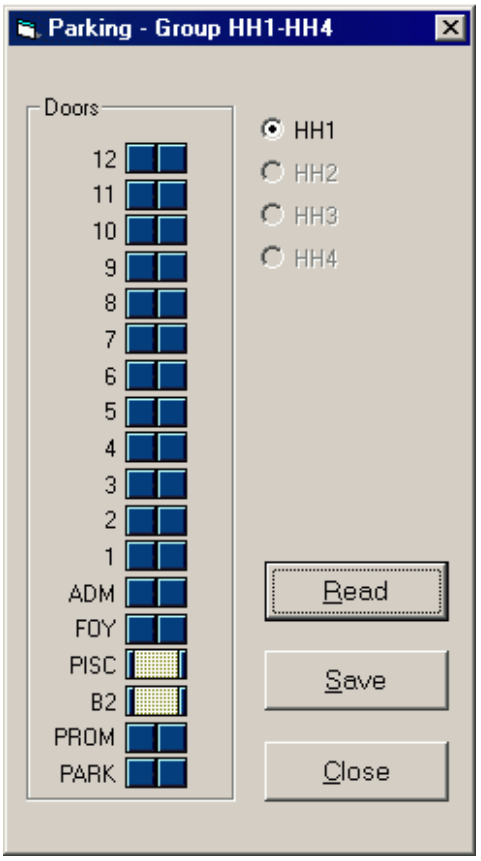
? Move the cursor on the "Opened doors parking". Wait a moment, and the elevators list should appear on the right.

? Move the cursor horizontally to the menu on the right and choose the group which the desired elevator is part of. In the case of a simplex, choose the name of the elevator.

? Click on the left mouse button.

Opened doors parking for triplex group, etc.:

In the following example, the door will permanently stay opened on the second floor, until it receives a hall call.



When the selected elevator is part of a group, move the mouse cursor in the corresponding white circle and click the left mouse button. A black dot should appear.

Move the cursor on the "READ" button and click the left mouse button.

To change the door state:

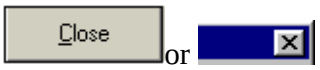
? Move the mouse cursor on the door picture at the desired level.

? Click once the left mouse button to open the door and a second time to close it.

? When the state of the door is determined, move the mouse cursor over the SAVE button and click the left mouse button. The message SUCCESS should appear at the top of the window. If not, save again.

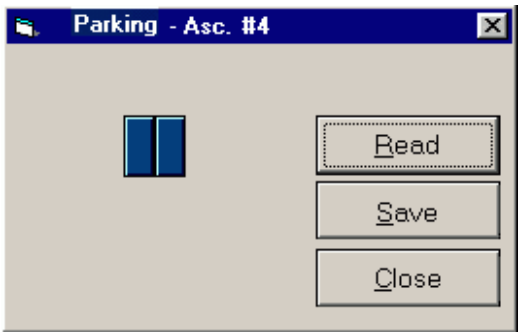
Repeat this operation for each elevator in the group.

? To exit the menu, move the cursor on either one of those buttons shown below and click on the left mouse button.



Opened doors parking for simplex elevators:

When the selected elevator is not part of a group, there can only be one parking level. Indicate the state of the doors when the elevator will be at this level.



To see and change the door state:

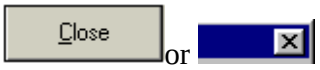
? Move the cursor over the READ button and click the left mouse button.

? If a change has to be made with the state of the door, move the cursor over the button showing a door.

? Click once the left mouse button to open the door, and a second time to close it.

? When the state of the door is determined, move the cursor over the SAVE button and click the left mouse button. The message SUCCESS should appear at the top of the window. If not, save again.

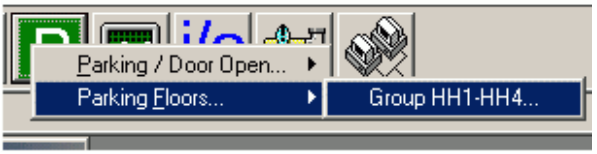
? To exit the menu, move the cursor over one or the other of the buttons shown below, and click the left mouse button.



Parking floors:

This option in the menu allows to indicate to each group or simplex elevator the desired parking levels.

? Move the cursor on the menu option that shows the letter "P", and click the left mouse button.



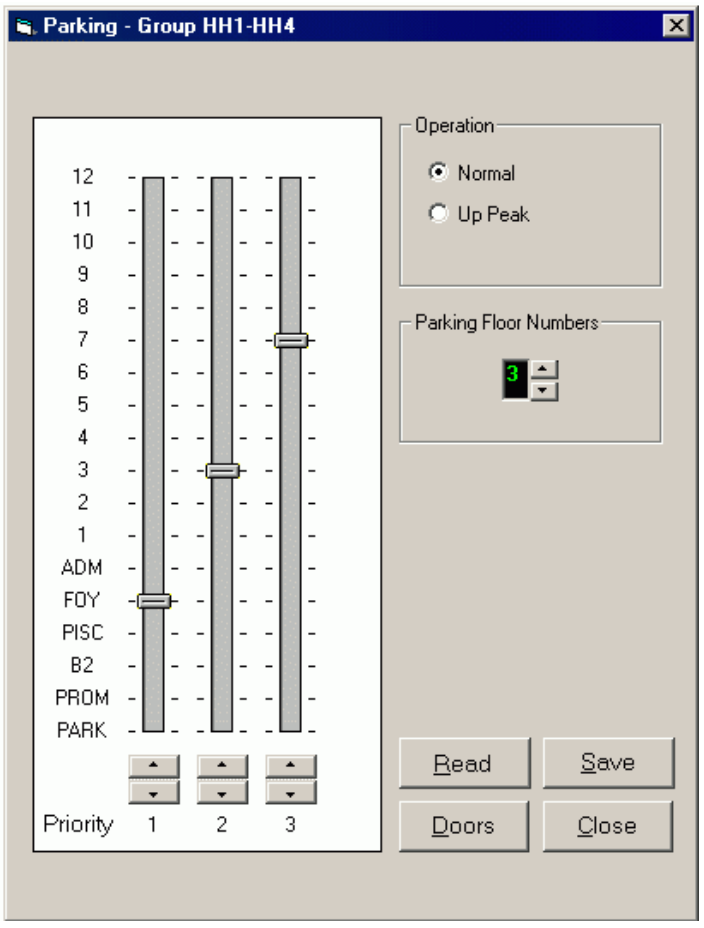
? Place the cursor on the PARKING FLOORS line. After a moment, the list of all the groups and simplex elevators should appear on the right.

? Move the mouse cursor horizontally on the name of the group or elevator desired.

? Click the left mouse button.

Parking floors for elevator group (triplex, etc.):

Parking levels dispatch works on a priority basis. The first available car will receive parking level priority 1. If a second car becomes available, it will receive priority 2. If a third car becomes available, it will receive priority 3.



Configurate the grid in a NORMAL operation mode or in an UP PEAK period for a duplex or group with a separate dispatcher.

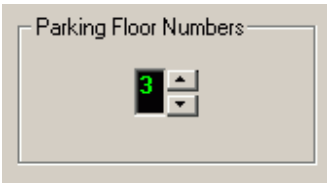
It is possible to decide how many parking floors there will be.

Selecting an operation mode:

Move the mouse cursor on the white circle at the left of the operation mode to modify, and click the left mouse button. In the example above, the NORMAL mode is selected.

Changing the number of parked cars:

Move the mouse cursor on either arrow in the PARKED CARS section. Each time you click the left mouse button, the number will go up or down.



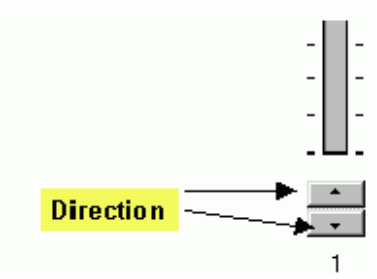
If the number goes down, elevators will disappear from the vertical columns.

In the example shown above, the priority 1 elevator will park at the 5th floor, and a second one will park at the 9th floor in priority 2. The third one will park at the 1st floor in priority 3. If vou have nothing, the car will remain at the same floor where it answered its last call (floating car).

Changing parking levels:

Move the mouse cursor over the up or down arrows located under the corresponding priority vertical bar.

Each time you click the left mouse button button, the cursor representing the elevator will either go up or down accordingly. Adjust until you reach the right parking level. Repeat for the other priorities.



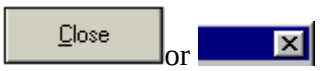
To transfer the parking floors in the dispatcher:

Move the mouse cursor on the SAVE button and click on the left mouse button.

The SUCCESS message should appear. If not, save again.

This button allows to access directly the OPEN DOOR PARKING menu.

To exit the window without modifying the parameters, move the mouse cursor on either one of those buttons and press the left mouse button.



or

11.15. FIRE RECALL FLOORS ON PHASE 1

DM98: Main recall floor, ground floor.

DM99: Alternative recall floor.

Door selection on return to main floor

DM148 = 0 = Front door

DM148 = 1 = Rear door

Door selection on return to alternative floor

DM149 = 0 = Front door

DM149 = 1 = Rear door

To obtain a return at level 2 on a fire alarm main floor return, write 2 in the DM98. If you write 0, the processor will put 1 by default. If you write a number larger than the number of floors serviced by the elevator, the processor will automatically change if for the number corresponding to the top floor.

To activate or deactivate the PFP or PFA detectors (if standard tape selector)

DM127 = 0000 = PFP detector activation

DM127 = 1234 = PFP detector deactivation

DM128 = 0000 = PFA detector activation

DM128 = 1234 = PFA detector deactivation

11.16. UP PEAK PERIOD FOR A TWO-CAR GROUP CONTROLLER (WITHOUT SEPARATE DISPATCH):

When a two-car group controller is provided with this option, the up peak period may be initiated by two ways:

1st method:

? If controller #1 is equipped with a 7 day/24 hour external clock, up peak periods for the group may be scheduled at specific moments for a specific laps of time.

2nd method:

? Both controllers may initiate automatically an up peak period by continuously monitoring up calls in the building.

In both ways, the dispatching of the parking floors during an up peak period must be programmed in controller #1 only, according to the following procedure.

The first car without any call will park itself at the first parking floor (priority #1) stored in DM1005. If the second car becomes also free of any call, it will be assigned to the second parking floor (priority #2) stored in DM1006.

When the building is going through an up peak period, only the parking floors are changed for that period. If "0000" is stored in DM1005 and DM1006, the up peak operation is disabled.

Programmed up peak:

? Priority #1 (DM1005) = The first available car will park at the level written in the DM1005. Example: 2 in the DM1005 = 2nd floor of the building.

? Priority #2 (DM1006) = The second available car (while the other is already at the level for priority #1) will park at the level written in the DM1006. Example: 1 in the DM1006 = first floor of the building.

Setting the parameters for 2nd method up peak operation to be programmed in controller #1:

? The number of up calls for BU, 2U and 3U floors necessary to initiate an up peak period.

There is a counter assigned to each one of those three floors that cumulates every call registered on its specific floor. If one of those counters reaches the value stored in DM1039 within the time lapse stored in DM1040, an up peak period is initiated.

A time lapse has to be determined to periodically reset the counters.

Example:

DM1039 = 5 = 5 calls within the time lapse

As soon as one of the counters reaches 5 calls within the time lapse, an up peak period is initiated.

? Lapse of time allowed cumulating calls on BU, 2U, and 3U floors.

The lapse of time allowed to cumulate the calls is stored in DM1040 in tenths of seconds.

Example:

DM1040 = 1200 = 120 sec. therefore, 2 minutes

Every 2 minutes, call counters on BU, 2U, 3U floors will be cleared

? Up peak period duration when it has been triggered automatically.

The duration of the up peak period is stored in DM1041 in minutes.

Example:

DM1041 = 0003 = 3 minutes period of time

So, for the 1st method, you have to program only DM1005 and DM1006; for the 2nd method, you have to program DM1005, DM1006, DM1039, DM1040, and DM1041

11.17. DOWN PEAK PERIOD FOR TWO-CAR GROUP (WITHOUT SEPARATE DISPATCH):

When a two-car group controller is provided with this option, the down peak period may be initiated two ways:

1st method

? If controller #1 is equipped with a 7 day/24 hour external clock, down peak periods for the group may be scheduled at specific moments for a specific lapse of time.

2nd method

? Both controllers may initiate automatically a down peak period by continuously monitoring down calls in the building.

In both ways, the dispatching of the parking floors during a down peak period must be programmed in controller #1 only, according to the following procedure.

The first car without any call will park itself at the first parking floor (priority #1) stored in DM1007. If the second car becomes also free of any call, it will be assigned to the second parking floor (priority #2) stored in DM1008

When the building is going through a down peak period, only the parking floors are changed for that period. If "0000" is stored in DM1007 and DM1008, the down peak operation is disabled.

Programmed down peak:

? Priority #1 (DM1007): The first car to become available will park at the level written in the DM1007. Example: 7 in the DM1007 = 7th floor of the building.

? Priority #2 (DM1008): The second car to become available (while the other one is already at the priority #1 level) will park at the level written in the DM1008. Example: 10 in the DM1008 = 10th floor of the building.

Operation parameters for 2nd method to only be programmed in controller #1:

? The total number of down calls for all floors necessary to initiate a down peak period.

A counter cumulates every down call registered on all floors. If that counter reaches the value stored in DM1035 within the lapse of time stored in DM1036, a down peak period is initiated.

A time lapse has to be determined to periodically reset the counters.

Example:

DM1035 = 0015 = 15 calls during lapse of time.

As soon as the counter reaches 15 calls within the lapse of time, a down peak period is initiated.

? Lapse of time allowed cumulating total down calls.

The lapse of time lapse allowed to cumulate the calls is stored in DM1036 in tenths of seconds.

Example:

DM1036 = 1200 = 120 sec. So, 2 minutes

Every 2 minutes, the down-call counter is reset.

? Down peak period when it been triggered automatically.

The duration of the down peak period is stored in DM1037 in minutes.

Example:

DM1037 = 0003 = 3 minutes lapse of time

So, for the 1st method, you have to program only DM1007 and DM1008; for the 2nd method, you have to program DM1007, DM1008, DM1035, DM1036, and DM1037.

For duplex controllers, the functions must be programmed in both controllers individually, except for the DM1003, DM1004, DM1005, DM1006, DM1007, DM1008, DM1035, DM1036, DM1037, DM1039, DM1040 and DM1041 which must only be programmed in controller #1.

11.18. UP PEAK PERIOD (OPTIONAL) FOR GROUP CONTROLLER (WITH SEPARATE DISPATCH):

The group assigns parking levels. Refer to the screen operator owner's manual.

11.19. DOWN PEAK PERIOD (OPTIONAL) FOR GROUP CONTROLLER (WITH SEPARATE DISPATCH):

The group assigns parking levels. Refer to the operator screen owner's manual.

11.20. NEXT CAR UP (FOR GROUP CONTROLLER WITH SEPARATE DISPATCH ONLY):

DM166 = 0 = disabled

DM166 = 1 = enabled.

11.21. BRAKE SWITCH CONTACT SETTINGS AND SUPERVISION:

The controller provides input for the brake contact limit switch. It is always better to monitor the brake operation.

If you do not install the switch, you need to deactivate that protection.

To activate or not the brake switch protection.

DM 0182:Put the value "1234" to deactivate the brake protection.

DM 0182:Put the value "0000" to enable the brake protection.

To reverse the brake switch input.

If you do not have an NO/NC contact on the brake switch, the program allows to reverse the input operation.

DM 0282:Put the value "0000" when the brake activates and it activated the PLC input.

DM 0282: Put the value "0001" when the brake activates and it desactivated the PLC input.

Brake operation supervision

DM0178: Time allowed to open the brake and activate the PLC input.

DM0179: Number of answered calls without opening of the brake. When the count has been reached, the elevator is placed out of service.

DM0180: Time allowed dropping. If the brake contact state did not change, the rope gripper will be applied.

DM0181: Re-levelling counter in the door zone. After DM0181 counts, the rope gripper will be applied.

11.22. MOTOR TEMPERATURE PROTECTION SETTING:

The controller provides input for the motor temperature protection. The drive has a built in overload protection.

To activate or not the motor temperature protection:

DM 0183:Put the value "1234" to deactivate the motor temperature protection.

DM 0183:Put the value "0000" to enable the motor temperature protection.

11.23. SOFTWARE DOOR CLOSE BUTTON SIMULATION:

If the controller does not have a door close button input "K" or if it has not a second contact on car call buttons, the PLC program can simulate a door close action as soon a car call is entered.

To activate or not the door close simulation:

DM 0077:Put the value "0000" to deactivate that option.

DM 0077:Put the value "0001" to enable that option.

DM 0035:Delay before giving the door close signal after the car call.

11.24. TEMPORARY AUTOMATIC ROPE GRIPPER RESET:

When the rope gripper has a mechanical problem or if the close doors contacts have intermittent problems, the controller can reset the automatic rope gripper if the doors contacts and the security line are in closed condition (normal). This solution however is temporary.

To activate and deactivate the automatic rope gripper reset:

DM0074 = 0 = disabled.

DM0074 = 1 = enabled.

11.25. GENERAL SIGNALS SETTINGS:

Inverting the GEN1 and GEN2 generator input signals:

Use the program to invert the PLC input operating if there is no NO/NC contact on the generator.

DM0285: Write "0000" when NO contacts feed the PLC input in generator mode.

DM0285: Write "0001" when NC contacts unfeed the PLC input in generator mode.

Troubleshooting order (in duplex mode only):

DM3100: 1st troubleshooting elevator in generator mode.

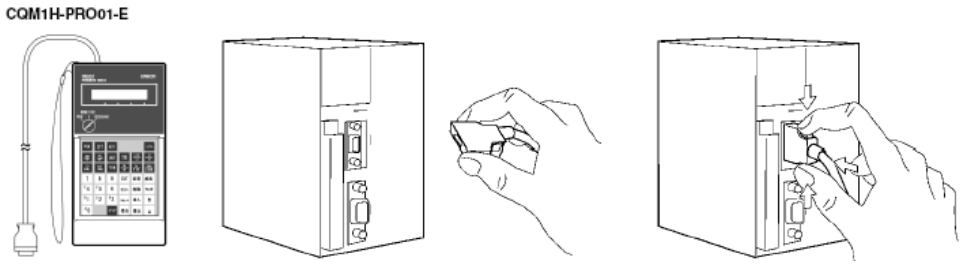
DM3101: 2nd troubleshooting elevator in generator mode.

Functioning order (in duplex mode only):

DM3110: 1st elevator to function when the selector is in automatic mode.

DM3111: 2nd elevator to function when the selector is in automatic mode.

11.26. MODIFY DM WITH THE PROGRAMMING TOOL:



To program these functions:

? Connect the C200H-PRO27 orCQM1-PRO01-E programmer:

? Place the key in "monitor" position, type the password CLR-MONTR-CLR. "00000" will be written on the screen and type:

DM	(DM number) Example: 0074	**MONTR**
	Screen =	**D0074 0000**
CHG		**PRES. VAL? D0074 0000 ????**

? Enter state 1 or 0;

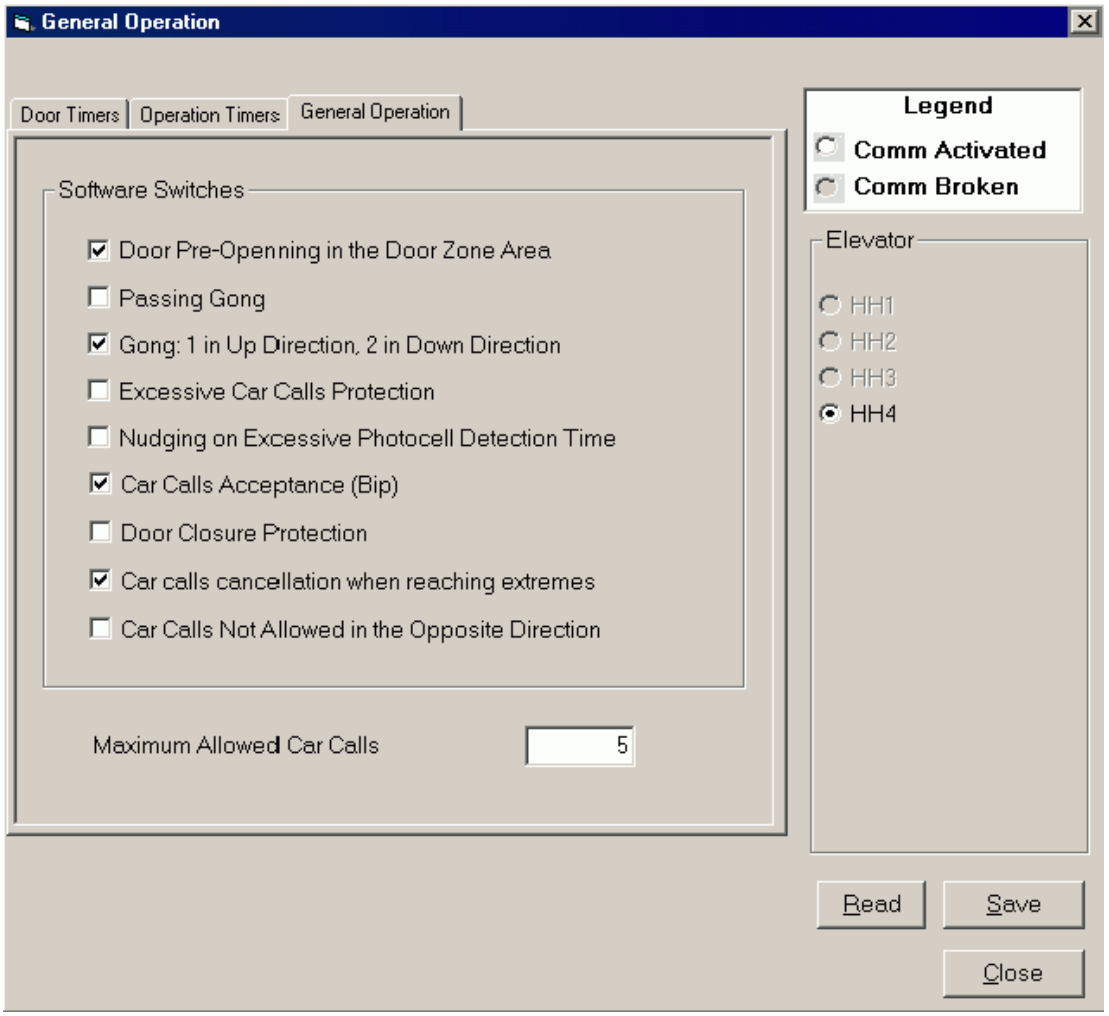
1	**PRES. VAL? D0074 0000 0001**
WRITE	**D0074 0001**

The function is now programmed.

11.27. MODIFY DM WITH OPERATOR SCREEN IN GENERAL OPERATION SECTION:

See GENERAL Operation section on the mechanical room computer.

In this window, if a little white box is checked, it indicates the option is activated. Move the mouse cursor to the box corresponding with the option to modify, and click once the left mouse button to check the box, and twice to uncheck it.


General Operation
Door Timers
Operation Timers
General Operation
Software Switches
Door Pre-Openning in the Door Zone Area
Passing Gong
Gong: 1 in Up Direction, 2 in Down Direction
Excessive Car Calls Protection
Nudging on Excessive Photocell Detection Time
Car Calls Acceptance (Bip)
Door Closure Protection
Car calls cancellation when reaching extremes
Car Calls Not Allowed in the Opposite Direction
Maximum Allowed Car Calls
5
Legend
Comm Activated
Comm Broken
Elevator
HH1
HH2
HH3
HH4
Read
Save
Close

12. SYMBOLS LISTING:

SA:	Car stop switch signal
PP:	Landing door relay
HDL:	Landing door locked
PC:	Car door relay
LEB:	Down extreme limit switch
LEH:	Up extreme limit switch
LNB:	Down normal limit switch
LNH:	Up normal limit switch
LRH:	Up slowdown limit switch
LRH1:	First up slowdown limit switch (300-400 FPM. elevator)
LRB:	Down slowdown limit switch
LRB1:	First down slowdown limit switch (300-400 FPM. elevator)
R:	Slowdown relay
SBR:	Power supply brake loss
BR:	Break relay
BRK:	Mechanical brake relay
HLD:	Mechanical brake holding voltage relay
SR:	Safety relay
SPR:	Security line relay
DZO:	Door zone
DZO1:	Door zone
LU:	Up leveling
LD:	Down levelling
DOL:	Opened door limit switch
DCL:	Closed door limit switch
RDOL:	Rear opened door limit switch
RDCL:	Rear closed door limit switch
BDS:	Safety edge
RBDS:	Rear safety edge
PH:	Door photocell
RPH:	Rear door photocell
ISR:	Inspection relay
BC-2C.3C…:	Car calls
2D-3D, 4D…:	Down hall calls
BU-2U, 3U…:	Up hall calls
SI:	Independent service
BZ-2Z, 3Z…:	Car zone
USL:	Zone count + up slowdown signal (Elevator 200 ft-250 FPM)

USL1:	Zone count + first up slowdown signal (Elevator. 300 ft-400 FPM)
USL2:	Zone count + second up slowdown signal (Elevator 300 ft-400 FPM)
DSL:	Zone count + Down slowdown signal (Elevator. 200 ft-250 FPM)
DSL1:	Zone count + first down slowdown signal (Elevator 300 ft-400 FPM)
DSL2:	Zone count + second down slowdown signal (Elevator 300 ft-400 FPM)
HT1/HT2:	Perforated tape high-speed counter signals
SU:	Car going up
SD:	Car going down
UCA:	Up direction relay
DCA:	Down direction relay
OP:	Door opening contactor
ROP:	Rear door opening contactor
CL:	Door closing contactor
RCL:	Rear door closing contactor
R5:	Trouble redundancy relay
XIN, XIN1:	Hoistway access relay
GEN1:	Emergency generator relay
GEN2:	Emergency power pre-signal
UG1-2:	Emergency power selector
FS (output):	Low speed nudging relais
INC:	Phase 1 activated
BUZ:	Phase 1, nudging, car call acceptance buzzer
FS (input):	Main floor recall on fire alarm
ALT:	Alternative floor recall on fire alarm
FMR:	Fire machine room alarm
GP:	Passing gong
GU:	Car gong with up arrow light
GD:	Car gong with down arrow light
CCA:	Car call recording bip
NUD:	Nudging buzzer
DRY:	Fault drive relay
PS1:	Levelling speed in door zones (7 FPM)
PS2:	Controller inspection speed (50 FPM)
PS1 + PS2:	Top of car inspection speed (maximum 150FPM)
PS4 + PS1:	One floor run speed (for elevators running at 300 and 400 FPM)
PS4 + PS2:	High speed
M:	Main contactor
M1:	Auxiliary main contactor
MA:	Drive enable relay
MT:	Off delay on "M" contactor at stopping

PR:	Potential relay
UDC:	Working relay
RSD:	Drive reset relay
RSR:	Rope gripper reset relay
RTB:	24 volts PLC battery test relay
RHT:	Backup time relay on power loss
GTS:	Rope gripper control relay
DLT:	Rope gripper condition relay
BAC:	Car stop car derivation relay
SPE:	Speak enable
SLH1:	First top first speed limiting device (300-400 FPM elevator)
SLH:	Top speed limiting device
SLB1:	First bottom speed limiting device (300-400 FPM. elevator)
SLB:	Bottom speed limiting device
ETSL:	Speed limiting device monitoring
150F:	150 FPM speed limiting device monitoring
THM:	Motor thermal contact

13. MAINTENANCE:

13.1. ALARMS:

13.1.1. The controller message indicator:

The PLC controller stores in the memory many alarms and diagnostic bits. All alarms and diagnostic bits are regrouped in 8 holding registers. These messages are displayed in the LCD screen. (See appendix C for instructions)

For alarm/diagnostic descriptions, read section 13.5

13.1.2. PLC alarm buffer access:

The PLC controller stores in memory many alarms and diagnostic bits that can be seen with the programming console.

All alarms are latched in holding registers "HR" which are not reset during power loss. To clear all faults, activate the maintenance switch in the controller 4 times within 30 seconds and all registers will be cleared.

13.1.3. Look up the alarms in the PLC controller:

If an alarm occurred, the corresponding bit will be put at 1. To look up the register, process like such:

? Connect the programmer.

? Place the key in "MONITOR" position.

? Type the CLR-MONTR-CLR password. "00000" will appear on the screen.

? Press the following keys:

SHIFT	CH / *	HR	8	0	MONTR	SHIFT	MONTR

Screen =

CH80
0000000001000000

Bit 15 Bit 00

? So, only the HR8006 alarm is activated. Afterwards, press:

✍

? See the whole register.

Screen =

CH81
0000010010000000

Bit 15 Bit 00

? So, HR8107 and HR8110 are initiated.

? Same process to look up the other registers (CH80 to CH87):

13.1.4. Emergency terminal stopping device alarms list in CJ1M PLC's or CPM2C:

The CJ1M or CPM2C controller keeps in memory several alarms that can be looked up with the programming terminal.

All alarms are kept in "H" registers. They are not lost when there are power losses. To clear all alarms, write down "0000" in the register.

To access the alarm list, press the following keys:

CLR	SHIFT	CH	HR	80	MONTR

To represent in binary form, press the following keys:

SHIFT	MONTR

Same representation as previous section.

Alarms list:

CJ1M – CPM2C

? H8000 – H0800: Tripped on the internal GOV 115% (verify gains in the drive and actual speed) in D60.

? H8001 – H0801: Tripped on a motor encoder lost (verify motor encoder).

? H8002 – H0802: Uncontrolled speed.

? H8003 – H0803: Tripped on "SLB1" excessive speed.

? H8004 – H0804: Tripped on "SLB" excessive speed.

? H8005 – H0805: Tripped on "SLH1" excessive speed.

? H8006 – H0806: Tripped on "SLH" excessive speed.

If the controller tripped on SLB/SLH excessive speed, it could be for one of the following problems:

? Verify the PLC output who command the drive. Maybe an output was in problem.

? Verify the mechanical slow down position installation. It should give a slow down command 1 or 2 inches after the normal slowdown magnets or perforated count. See section 4.6 for position.

? The drive did not stop on a decel command. If that problem repeats, the drive processor should be replaced.

13.2. PLC BATTERY REPLACEMENT:

The battery lifetime is approximately five years. If the voltage level becomes too low, the ALARM indicator on the PLC will flash and the car will be turned "out of order". Then, you must replace the battery within one week. Replacement dates of the battery are indicated on the CPU front cover. The catalog number for the battery is 3G2A9-BAT08.

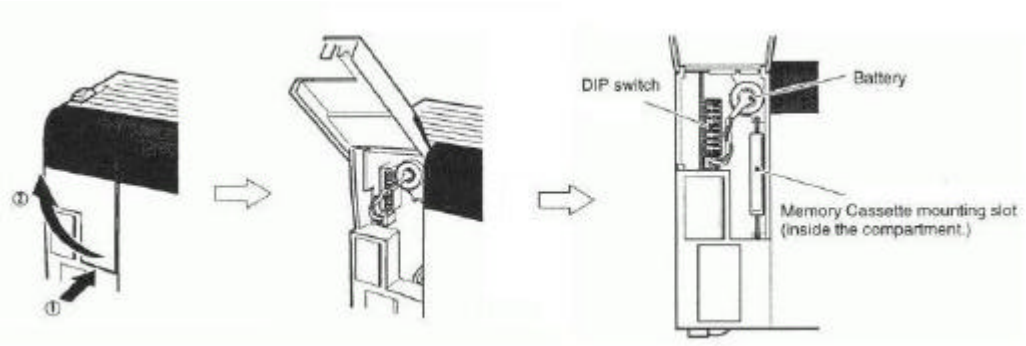
WARNING

When replacing the battery, you must proceed quickly (within 5 minutes), or else, you will loose the PLC program.

Follow these steps to replace the battery:

? Turn off the main power.

? Open the cover above the peripheral port on the CPU. You should now see the battery.



? Pull out the battery and unplug its connector.

? Quickly put the new battery in place and plug the connector.

? Turn the main power on.

? Though it is not mandatory, you should erase the "low battery" message in the CPU. However, you have to do it if a "low battery" alarm is active.

✍ Connect the hand held programmer;

✍ Type in the password CLR-MONTR-CLR ;

✍ The screen will display "low batt";

✍ Type in CLR-FUN-MONTR-MONTR.

? Make sure that POWER and RUN indicators on the CPU are on. Then you may turn the elevator back in service.

13.3. INPUT/OUTPUT MODULES:

Output module (CQM1-OC222):

Output modules are provided with 2AMP rated not removable relays. Those relays may become defective after some hundreds of thousands of operations or if their contacts are overloaded. (Relay part number: G6D-1A-DC5)

Output module (CQM1-OD213):

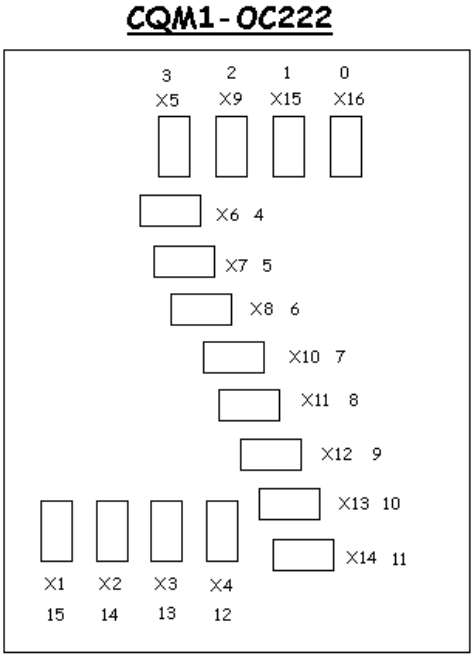
The PLC output module includes 100ma 24VDC optocouplers. It also includes a protective pico fuse which can be damaged if the 120VAC is applied on the module (fuse replacement number: MCR03.5). See the graph below for the exact position of the "F1 125V 3.5A" fuse.

Output problems :

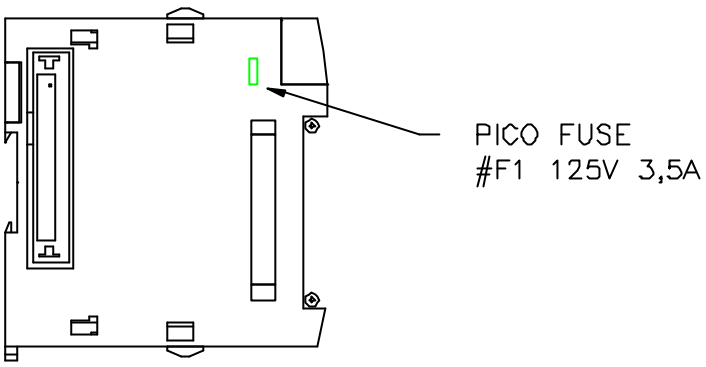
? If the red output led is "ON" but there is no voltage on the corresponding terminal; the relay may be in trouble. Replace the module.

? If the red output led is "OFF" but there is a voltage on the corresponding terminal, the relay contact may be "soldered". Replace the module.

Relay positioning in the CQM1-OC222 module:



Fuse positioning in the CQM1-OD213 module:



Input module (CQM1-ID212, 24VDC ou CQM1-IA121, 120VAC):

? The controller is provided with 16 points 24VDC or 8 points 120VAC input module. This type of input module is built with opto-couplers able to withstand millions of operations. However, an excessive input voltage level may damage those inputs.

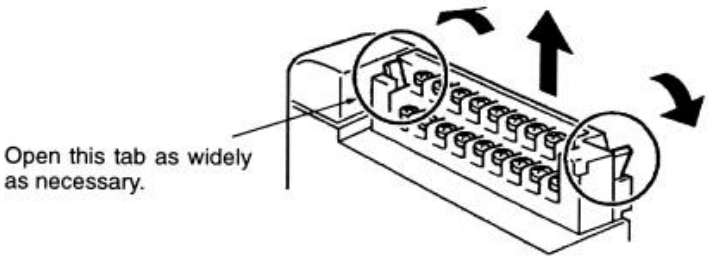
Input problems:

? If there is some voltage on input but the corresponding red input led is "OFF"; the opto-coupler may be in trouble. Replace the module.

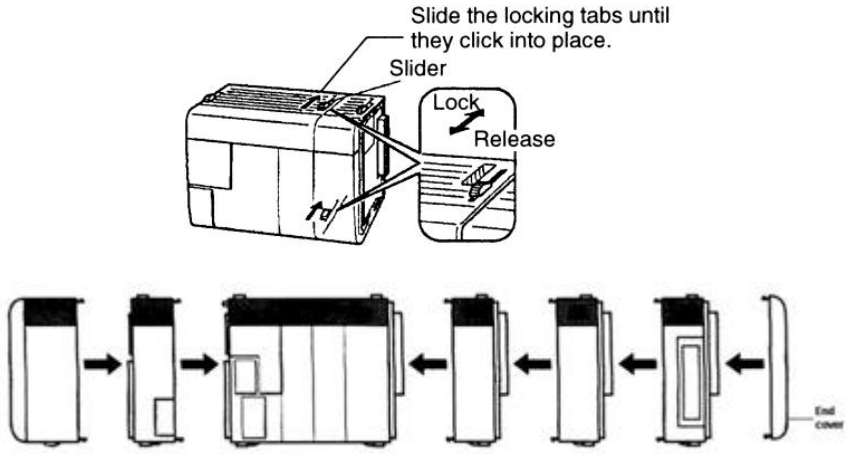
Module replacement:

Always turn off the power before removing or putting in a module in the PLC.

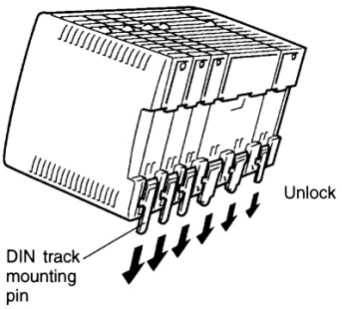
? Remove the terminal block.



? Push back the yellow sliding locks on the top and bottom of each module towards the mounting plate as indicated in the figure below. Slide the modules to the right, to free the one to be replaced



? Release the holding clips at the bottom of the module



? Take the defe ctive module off the rail by releasing the holding clip at the bottom of the module.

? Put in the new module at the same location and go back through the previous steps.

Make sure the right end cover is back in place, or the PLC will not work properly.

Re-assignment of an I/O as an emergency solution:

If you have to replace an I/O point, and you do not have a spare one, program the troubled output on a spare output, but only if it shares the same voltage.

Bring your programming tool in the machine room and call us. To be able to change the program, you need a password. We will tell you what to do for the I/O address modification

13.4. PEAK VOLTAGE PROTECTION:

Please note a wrong connection could short-circuit the "TVS" (transiant voltage suppressor) that protects the elevator. If it occurs, they must be verified and replaced if needed.

To verify them, use an ohmmeter and place the sensors on the "TVS" terminals. If the value shown is 0, the "TVS" is short-circuited.

13.5. ALARM DESCRIPTIONS:

Alarms #:	Description:	Causes et verifications
HR8000	Available	
HR8001	The PLC controller battery alarm	See section **Erreur ! Source du renvoi introuvable.** of user's manual for the PLC battery replacement.
HR8002	Excessive travel time.	The elevator has exceeded the DM0008 or DM0017 delay during the travel. Verify: the elevator commute, the LRH/LRB slowdown limits and the drive speed control circuit board.
HR8003	Phase lost / inverse detection	Verify the controller's main input voltage, the supply and the contact of «RPR» relay.
HR8004	Weight sensor "**LW2**" was activated.	Verify the weight load device that activated the LW2 input.
HR8005	Over temperature motor sensor detection "**THM**"	Verify the state of the thermal sensor that activated the THM input.
HR8006	Desactivation of the rope gripper contacts in the safety line.	Verify the rope gripper contacts between RG5 and RG7. They opened the safety line. For more details, see the electrical drawings.
HR8007	One of the 2 door zone sensors "**DZO**" and "**DZO1**" remained activated out of the levelling zone.	Verify the tape head. One of the sensors remained activated.
HR8008	"**DZO**" and "**DZO1**" door zone sensor did not operate properly in levelling zone.	Verify the tape head. One of the sensors did not activate.
HR8009	«**MDI**» contactor did not activate.	Verify braking resistor + drive + thermal sensor.
HR8010	"**LU**" Levelling Up sensor did not operate properly in levelling zone.	Verify the relay and sensor operation in the top of car reader connecting box.
HR8011	"**LD**" Levelling Down sensor did not operate properly in levelling zone.	Verify the relay and sensor operation in the top of car reader connecting box.
HR8012	**DCL** switch did not open when **front** door closed.	Verify DCL switch operation. The switch did not open before the DM0032 delay, when front door closed, with PP and PC switches closed.
HR8013	**DCL** did not close when **front** door opened.	Verify DCL switch operation. The switch did not close when the front door opened, with DOL switch opened, PC and PP switches closed. The DCL switch opened more than a half second while the front door was

Alarms #:	Description:	Causes et verifications
HR8014	**DOL** switch did not open when **front** door opened.	completely opened. Verify DOL switch operation. The switch did not open when the front door is completely opened, or the door did not completely open after 12 sedonds on door opening instruction when DCL switch and OP relay are closed.
HR8015	**DOL** switch did not close when **front** door closed.	Verify DOL switch operation. The switch did not close when the front door closed, with DCL switch opened and PP closed.
HR8100	**RDCL** switch did not open when **rear** door closed.	Verify RDCL switch operation. The switch did not open before DM0032 delay when rear door is closing, with PC and PP switches closed.
HR8101	**RDCL** switch did not close when **rear** door opened.	Verify RDCL switch operation. The switch did not close when rear door opened, RDOL switches opened, PC and PP switches closed. The RDCL switch opened more than a half second while the rear door was completely opened.
HR8102	**RDOL** switch did not open when **rear** door opened.	Verify RDOL switch operation. The switch did not open when rear door opened or the door did not fully open after 12 seconds on door opening instruction when RDCL switch and ROP relay are closed.
HR8103	**RDOL** switch did not close when **rear** door closed	Verify RDOL switch operation. The switch did not close when rear door closed, with RDCL switches opened and PP closed.
HR8104	**PP** landing doors contact did not close when doors closed.	Verify PP landing doors contact. The contact did not close when door was fully closed, after 20 seconds, DCL and RDCL opened, CL and RCL relays activated. Verify DCL and RDCL switches operations.
HR8105	**PC** car doors contact did not close when doors closed	Verify PC car doors contact. The contact did not close when door was fully closed, after 20 seconds, DCL and RDCL opened, CL and RCL relays activated. Verify DCL and RDCL switches operations.

Alarms #:	Description:	Causes et verifications
HR8106	**PC** or **PP** contacts did not open when doors opened.	Verify PC and PP operation. PC and PP contacts did not open when doors opened, DCL and RDCL switches opened. Verify if either contact is short-circuited and DCL and RDCL switches operation. This fault can occur if those switches are not opened when PP and PC are fully closed.
HR8107	**Front** door did not close completely after 5 attempts.	Verify doorway. Something might be blocking. Check PP and PC contacts operation. Also check DCL switch operation.
HR8108	**Rear** door did not close completely after 5 attempts.	Verify doorway. Something might be blocking. Check PP and PC contacts operation. Also check RDCL switch operation.
HR8109	The elevator moved more than 12" with open doors without a start command	Verify the brake and the perforated tape.
HR8110	**ETSL** relay tripped. Speed redundancy.	Refer to section **Erreur ! Source du renvoi introuvable.** about alarm codes for CJM1 processor.
HR8111	**J9** security line was opened**.**	J9 security line opened while the elevator was moving or 4 seconds after it had stopped. Verify security line switches (see drawings for more details).
HR8112	Variable speed drive fault.	Refer to section **Erreur ! Source du renvoi introuvable.** to access alarms list. Verify RDY signal condition, as it should be activated.
HR8113	**M** contactor failure.	Verify M contactor and M1 relay operation when opening and closing. Verify M and M1 processor input contacts operation.
HR8114	Available	
HR8115	Perforated tape reader malfunction.	The processor receives too many or not enough pulses from the perforated tape. Verify HT1 and HT2 indicators operation on the processor (they should be flashing when elevator is moving). Clean both infrared transmitters and the hoistway mirror.
HR8200	The variable speed drive did not follow the PLC speed command.	Verify transistor output for PS1, PS2, PS3, PS5, and PS6.
HR8201	**UDC** relay failure.	Verify UDC relay operation when opening and closing.

Alarms #:	Description:	Causes et verifications
HR8202	**MA** relay failure.	Verify circuit operation on UDC processor input. Verify MA relay operation when opening and closing. Verify MA circuit operation on MA processor input.
HR8203	The elevator slides in the brake pads after floor stop.	The elevator has moved +/- 6 inches when stopped at a floor. Verify brake springs adjustment.
HR8204	Uncontrolled elevator speed (CVI).	The elevator speed was over 150 FPM in the levelling zone or in inspection mode. The perforated tape or the encoder counter may be loosing counts. Refer to section **Erreur ! Source du renvoi introuvable.**.
HR8205	**SR** security line supervision was lost.	SR security line opened while the elevator was moving or 4 seconds after it had stopped. Verify security line switches (see drawings for more details).
HR8206	**RUN** did not come on at a start command.	Verify the MA transistor output. Make sure the drive receives the start command.
HR8207	Rope gripper activation by programmable PLC.	Verify if PP and PC opened outside the DZO. The car re-levelled at a floor more than 5 times within 60 seconds. Verify, if needed, the mechanical brake switch. The car traveled more than 6 inches, without command, while it was stopped at a landing.
HR8208	The elevator moved in the wrong direction.	Verify drive "% No load current, Inertia" adjustments and gains. Check if the drive can maintain the load. Check M contactor operation.
HR8209	Car door contact **PC** relay opened during movement out of door zone.	Verify PC contacts operation and clean them.
HR8210	Hall door contact **PP** relay opened during movement out of door zone.	Verify PP contacts operation and clean them. This can occur when mechanics open the hall doors with a lunar key, while the elevator is moving.
HR8211	Brake malfunction at opening or closing.	It takes too much time for the brake to activate or it does not open. Check the mechanical brake operation. Also check brake springs adjustments.
HR8212	The actual speed does not follow the internal reference from the variable speed drive (Speed deviation low).	Verify the motor encoder rotation direction versus the motor's. Verify the motor adjustment parameters.
HR8213	Excessive re-levelling attempts at the same floor.	Verify levelling speed PS1 in the drive. Verify mechanical brake closing operation.

Alarms #:	Description:	Causes et verifications
HR8214	The PLC does not receive the uncontrolled speed signal (**CVI**) (150 FPM).	Verify cable connection on **JRT-OVS-GL2** PC board **CVI** terminal (Elevators at 200 FPM only). The yellow LED should always be light and the red LED should light up each time the elevator moves in automatic mode. (Refer to section **Erreur ! Source du renvoi introuvable.**) (for elevators going at 200 FPM). Verify the CV1 led on the CJ1M processor, the CVI led should light up each time the elevators moves in automatic mode (Refer to section **Erreur ! Source du renvoi introuvable.**).
HR8215	PLC 24 volts DC backup battery failure (+ 24 V and OV).	The backup battery does not maintain the active PLC during 15 sec. when a power failure occurs. Verify battery charger or replace the battery pack.
HR8300	**LRH/1** and **LRB/1** top and bottom slow down limit were activated at the same time.	Verify electrical wiring and physical contacts.
HR8301	**LRB1** bottom slow down limit did not operate properly.	Verify electrical wiring and physical contacts.
HR8302	**LRH1** top slow down limit did not operate properly.	Verify electrical wiring and physical contacts.
HR8303	**LRB** bottom slow down limit did not operate properly.	Verify electrical wiring and physical contacts.
HR8304	**LRH** top slow down limit did not operate properly.	Verify electrical wiring and physical contacts.
HR8305	**SLB/1** and **SLH/1** emergency speed limiting devices were activated at the same time.	Verify electrical wiring and physical contacts.
HR8306	**SLB1** bottom emergency speed limiting device did not operate properly.	Verify electrical wiring and physical contacts.
HR8307	**SLH1** top emergency speed limiting device did not operate properly.	Verify electrical wiring and physical contacts.
HR8308	**SLB** bottom emergency speed limiting device did not operate properly.	Verify electrical wiring and physical contacts.
HR8309	**SLH** top emergency speed limiting device did not operate properly.	Verify electrical wiring and physical contacts.
HR8310	**LNB** down normal limit switch failure.	Verify electrical wiring and limit switch contact.
HR8311	**LNH** up normal limit switch failure.	Verify electrical wiring and limit switch contact.
HR8312	Motor overload detected by the drive **Motor overload**.	Verify the motor's electrical connexion and its voltage (D2 parameter, motor current, inside the drive). Make sure no mechanical trouble prevents the car from

Alarms #:	Description:	Causes et verifications
HR8313	Earthquake Service	moving. Verify the state of the inputs “Seismic switch” and “Counterweigh derailment switch” and reset the sequence with the button “Reset earthquake service”.
HR8314	Wrong LRB adjustment	The limit is too far from the deceleration point. The DM360 is even to the holes difference between the deceleration point and the slowdown limit. Readjust consequently.
HR8315	Wrong LRB1 adjustment	The limit is too far from the deceleration point. The DM364 is even to the holes difference between the deceleration point and the slowdown limit. Readjust consequently.
HR8400	Wrong LRH adjustment	The limit is too far from the deceleration point. The DM362 is even to the holes difference between the deceleration point and the slowdown limit. Readjust consequently.
HR8401	Available	
HR8402	Available	
HR8403	Available	
HR8404	Available	
HR8405	Wrong LRH1 adjustment	The limit is too far from the deceleration point. The DM366 is even to the holes difference between the deceleration point and the slowdown limit. Readjust consequently.
HR8406 HR8407	Available Available	
HR8408	Available	
HR8408	Available	
HR8409	Available	
HR8410 HR8411	Available Corrupted data	 PLC’s data are corrupted. Defective PLC or data loss.
HR8412	Available	
HR8413	Available	

Alarms #:	Description:	Causes et verifications
HR8414	Available	
HR8415	Master Dupline module communication failure.	Verify wiring connections and voltage.
	Note: HR85-86-87 are R5 and ETSL relays redundancy faults.	
HR8500	**DZO** relay did not activate.	Verify DZO relay operation, because it did not activate when the PLC DZO input activated.
HR8501	**DZO** relay contacts remained closed.	Verify DZO relay operation, because it remained closed when the PLC DZO input deactivated
HR8502	**DZO1** relay did not activate	Verify DZO1 relay operation, because it did not activate when the PLC DZO1 input activated.
HR8503	**DZO1** relay contacts remained closed.	Verify DZO1 relay operation, because it remained closed when the PLC DZO1 input deactivated
HR8504	Available	
HR8505	Available	
HR8506	**LU** and **LD** levelling sensors were activated. at the same time.	Verify LU and LD relays operation. Verify the sensor operation in the top of car reader connecting box
HR8507	**ISR** relay did not activate.	Verify ISR relay operation, because it did not activate when the PLC ISR input activated
HR8508	**ISR** relay has remained closed.	Verify ISR relay operation, because it remained closed when the PLC ISR input deactivated
HR8509	**PP** relay did not activate.	Verify PP relay operation, because it did not activate when the PLC PP input activated
HR8510	**PP** relay has remained closed.	Verify PP relay operation, because it remained closed when the PLC PP input deactivated
HR8511	**PC** relay did not activate.	Verify PC relay operation, because it did not activate when the PLC PC input activated
HR8512	**PC** relay has remained closed.	Verify PC relay operation, because it remained closed when the PLC DZO input deactivated
HR8513	**BAC** or **BAC1** relay did not activate.	Verify BAC relay operation, because it did not activate when the PLC BAC input activated
HR8514	**BAC** or **BAC1** relay has remained closed.	Verify BAC relay operation, because it remained closed when the PLC BAC input deactivated
HR8515	Available	

Alarms #:	Description:	Causes et verifications
HR8600	**ETSL** relay did not activate.	Verify ETSL relay operation, because it did not activate when the PLC ETSL input activated
HR8601	**ETSL** relay has remained closed.	Verify ETSL relay operation, because it remained closed when the PLC ETSL input deactivated
HR8602	Available	
HR8603	**XIN** relay did not activate.	Verify XIN relay operation, because it did not activate when the PLC XIN input activated
HR8604	**XIN** relay has remained closed.	Verify XIN relay operation, because it remained closed when the PLC XIN input deactivated
HR8605	**R5** relay did not activate.	Verify R5 relay operation, because it did not activate when the PLC R5 input activated
HR8606	**R5** relay has remained closed.	Verify R5 relay operation, because it remained closed when the PLC R5 input deactivated
HR8607	Available	
HR8608	Available	
HR8609	**PR** relay did not activate.	Verify PR relay operation, because it did not activate when the PLC PR input activated
HR8610	**PR** relay has remained closed.	Verify PR relay operation, because it remained closed when the PLC PR input deactivated
HR8611	**HDL** relay did not activate.	Verify HDL relay operation, because it did not activate when the PLC HDL input activated
HR8612	**HDL** relay has remained closed.	Verify HDL relay operation, because it remained closed when the PLC HDL input deactivated
HR8613	24 Volts DC **+A** power failure.	Verify protection fuse. The filament could be defective. There may have been a short-circuit.
HR8614	Available	
HR8615	Available	
HR8700	Available	
HR8701	Available	
HR8702	**GTS** relay did not activate.	Verify GTS relay operation, because it did not activate when the PLC GTS input activated
HR8703	**GTS** relay has remained closed.	Verify GTS relay operation, because it remained closed when the PLC GTS input deactivated

Alarms #:	**Description:**	**Causes et verifications**
HR8704	**DLT** relay did not activate.	Verify DLT relay operation, because it did not activate when the PLC DLT input activated
HR8705	**DLT** relay has remained closed.	Verify DLT relay operation, because it remained closed when the PLC DLT input deactivated
HR8706	Available	
HR8707	Available	
HR8708	Available	
HR8709	Available	
HR8710	Available	
HR8711	Available	
HR8712	Available	
HR8713	Available	
HR8714	**UP/DW** relay did not activate.	Verify UP/DW relay operation, because it did not activate when the PLC UP/DW input activated
HR8715	**UP/DW** relay has remained closed.	Verify UP/DW relay operation, because it remained closed when the PLC UP/DW input deactivated